

# COAL AGE

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No. 11

## The Motive

BY BERTON BRALEY

*Written expressly for Coal Age*

We go below in the shakin' cage  
To drill an' cut the coal,  
To shoot an' load for our daily wage  
An' work like a bloomin' mole,  
An' why do we take the chanct of damp,  
An' the chanct that the roof will fall?  
An' why do we tote a miner's lamp?  
Fer the wife an' the kids—that's all?

The boss he plans an' the boss he frets  
At tryin' to "make her pay,"  
He thinks an' schemes for the wealth he gets  
From the depths of the mine each day,  
An' why does he drive us for all he's worth  
An' swear that our work is small,  
An' why does he want to own the earth?  
For his wife an' his kids—that's all!

The Irish fight with the Hun and Wop  
And the English scraps the Russ,  
An' the oaths an' grumbles never stop  
When the Finn an' the Magyar fuss,  
They quarrel an' fight till heads are broke  
An' the cops get a hurry call,  
But they all work on till the day they croak,  
For the wife an' the kids—that's all!

Yes, that's one way we are all alike,  
Whatever the work we do,  
Tony and Oscar and Hans and Mike,  
Master and Miner, too,  
Our job may weary us, head to feet,  
An' our pay seem pretty small,  
But it's all worthwhile when at night we meet  
The wife an' the kids—that's all!

## Ideas and Suggestions

### Automatic Arrangement for Raising End Gates on Mine Cars

BY ELKINS READ\*

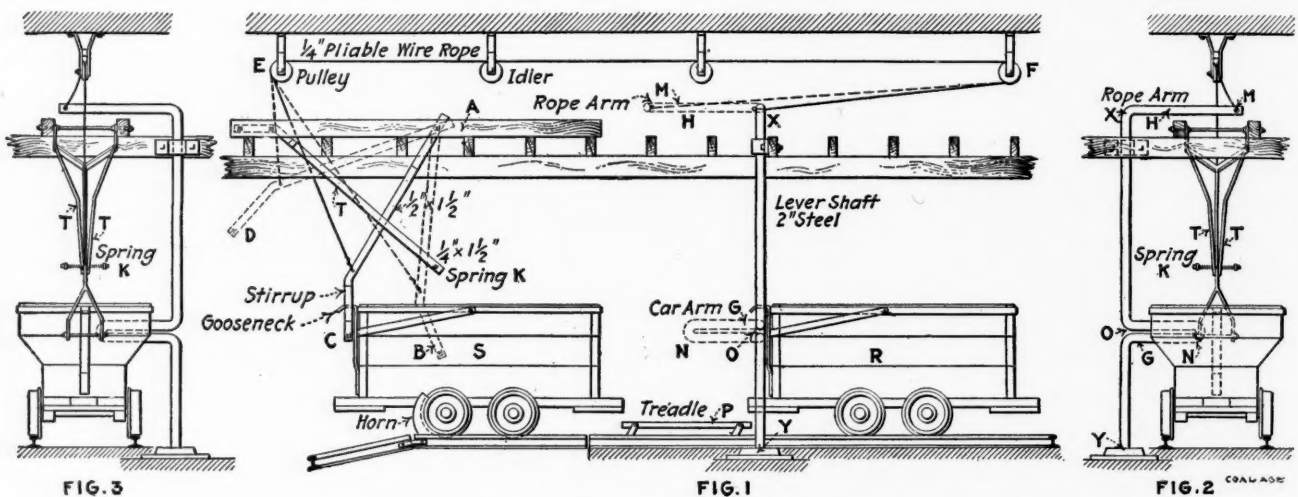
The automatic arrangement for raising the end gates of mine cars here described has proved economical in time and labor, aside from eliminating to a considerable extent accidents at the dump.

The incoming load *R*, Fig. 1, engages car arm *G*, which projects over the track. This revolves the vertical shaft

sary to observe in order to obtain good results. The lever shaft *XY* should be placed back from the dump a sufficient distance so that the stirrup will be in the position *AD* before the incoming load bumps the standing empty. At the same time it should be certain that the stirrup will come to rest at *AB* before the load *R* engages it.

#### SOME DETAILS OF CONSTRUCTION

The lever shaft should be set back about 2 ft. from the rail and the arm should be approximately 4 ft. long. The stirrup should be made about 6 ft. in length, fixing



THE AUTOMATIC END GATE RAISER

*XY* and rope arm *MX*, causing the end of the arm *M* to move forward to the projected position. This movement carries the rope forward as shown, pulling the stirrup *AC* to the position *AD*. Load *R* advances and bumps the empty car *S* off the dump. The car arm *G* meanwhile rubs along the side of the car until it is released, thus keeping the stirrup up until the empty is out of the way.

After the load *R* has released the lever *G*, the stirrup falls to the position *AB*, pulling the lever shaft and arm back to their original positions. As the stirrup falls to the position *AB*, it wedges into the straps *TT*, which are in turn held by the spring *K*. It is essential that this stirrup be in approximately the position *AB* and at rest when the incoming load engages it, as under this condition no matter with what velocity the car approaches there will be no disastrous results, as the stirrup will be carried along with the car and be in perfect readiness to engage the gooseneck. This enables the dump man to throw his lever and let the dump tilt at the instant that the car strikes the horns.

The exact position and size of the several parts will necessarily depend upon local conditions, such as the size of the car, etc. However, there are a few points neces-

sary to observe in order to obtain good results. The lever shaft *XY* should be placed back from the dump a sufficient distance so that the stirrup will be in the position *AD* before the incoming load bumps the standing empty. At the same time it should be certain that the stirrup will come to rest at *AB* before the load *R* engages it.

There should be a weak link somewhere in the rope, so that if the incoming load should strike the car arm while the dump is down, this link will straighten out and relieve undue strain, after which another one can be substituted. Placing idlers so as to carry the weight of the rope eliminates the necessity of attaching a counterweight to pull the lever arm back into position, since under this favorable condition the stirrup performs this function.

This device can be made at any mine blacksmith shop at a moderate cost. Time and money will, however, be saved by first making a rough model to be used for finding the exact length and position of the entire appliance.

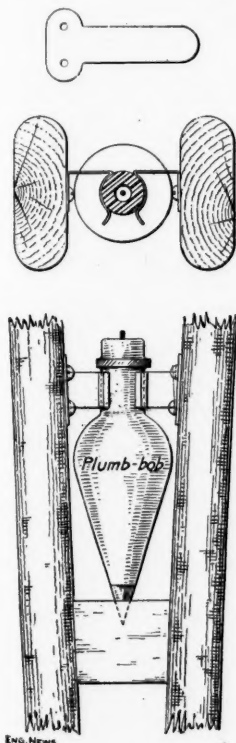
An arrangement of this kind, working in conjunction with a car haul and dumping into a reciprocating hopper feeder, allows coal to be dumped and screened at the rate of six 2-ton cars per minute over a Phillip's crossover dump.

The common practice of running electric motors and electric currents through the return air courses of dusty mines is dangerous and should be strictly forbidden.

\*Mining engineer, Maryland Coal Co. of West Virginia, Simpson, W. Va.

## Plumb-Bob Holder for Transit Leg

The description of a device for holding a plumb-bob, in *Engineering News* of Nov. 20 (see *COAL AGE*, Vol. 4, p. 898), has called forth a description of another, which the inventor, C. M. Lawrence, County Surveyor of Hughes County, Oklahoma, believes much superior. His directions are as follows:



A BRASS SPRING  
PLUMB-BOB  
HOLDER FOR  
TRANSIT LEG

Cut two pieces of thin spring brass (mine are cut from the shell of a discarded alarm clock) as shown in the accompanying sketch. Bend as shown, and fasten in the split leg with  $\frac{3}{8}$ -in. round-head brass screws. I also cut from the same material an oval plate, and tack it on the block below with brass brads before boring the  $\frac{3}{16}$ -in. hole for bob point. A very light grip will hold the bob, even up to a jolt which would put the instrument out of business. No parts project. And no "trigger work."

## A Useful Hitch

R. C. Hardman, Colorado Springs, Colo., sends the following description of a rope hitch, which he believes has not been described previously in print:

In tying the knot a bight is taken wherever desired, as shown in Fig. 1. Then catching the the bight at the points *a* and

*b*, the bight is turned over in a direction away from the tier, so that the knot assumes the shape shown in Fig. 2. Another turn is made in the same direction with Fig. 3 as the result. These two turns are made, in practice, in

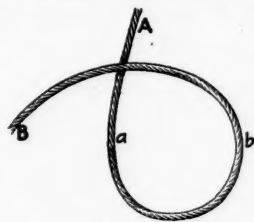


FIG. 1

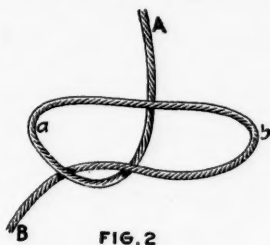


FIG. 2

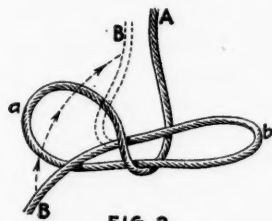


FIG. 3



FIG. 4

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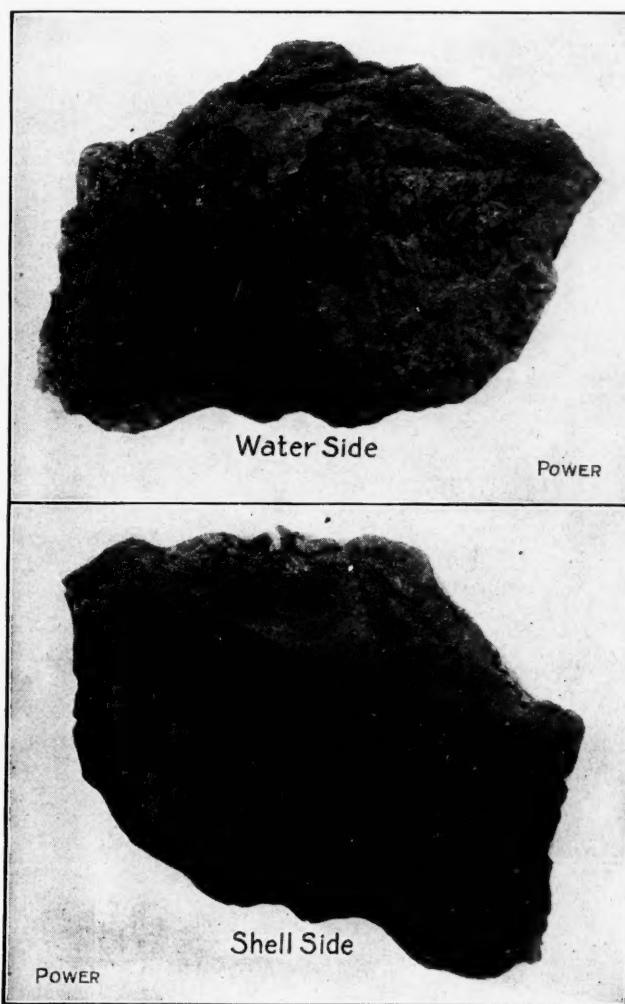
one operation, Fig. 3 being merely a 360-deg. turn of the bight in Fig. 1. The line *B* is then placed beside the line *A* and the loops *a* and *b* are brought together back of the lines *A* and *B*. A hook or other fastening may then be placed in the double loop so made and a strain

taken on the line *A*. The finished knot is shown in Fig. 4. Care must be taken to have the line *B* beside the line *A* or the knot will not hold. When the strain is taken off and the hook removed the knot falls apart. Its principal use is on a fall line, or any line to which power is applied, in case a temporary pull is desired at any point other than that at which power is usually applied. It may be used also in various other cases which will be obvious after the knot is known.—*Engineering News*.

✽

## Scale Removed by Graphite

The photographs show the front and back views of a piece of scale taken from the bottom front end of a 8-ft. x 30-ft. Lancashire boiler on which we have been using graphite for about three months, says E. Russell in *Power* of Mar. 3, 1914. This boiler is one of a battery of three, fed from a dirty river, the water from



A PIECE OF SCALE REMOVED BY GRAPHITE

which leaves moderately hard scale which formerly had to be chipped off, but since using graphite the boilers are as clean as it is practicable to get boilers. What little scale remains may be easily brushed or scraped off; it is not necessary to use a scaling hammer. On examining the front view it will be seen how effectively the scale has been driven off the shell plate and flues and collected in layers on the bottom of the boilers.



# Some Efficient Compressed-Air Plants in Coal Mines

By S. W. SYMONS\*

*SYNOPSIS—Four plants in the anthracite region of Pennsylvania are here described which, by comparison with many installations of a similar character and made for a like purpose, may be truly said to be efficient.*

Economy in the operation of machinery, like the cost of living, is rather more a question of ratios than one of absolute values. The cycle of operations in the compressed-air mining installation is so long and complex from the combustion of the fuel in the boiler furnace

which are in successful daily operation in the anthracite-coal region of Pennsylvania.

In compressed-air installations, the coal-mine operator may well profit by the experience of the iron and metal mines, where air-actuated rock-cutting machinery is a necessity and where, in most cases, economical Corliss engines or electric-motor-driven compressors are installed.

At the No. 5 colliery of the Lehigh & Wilkes-Barre Coal Co., at South Wilkes-Barre, Penn., air has been

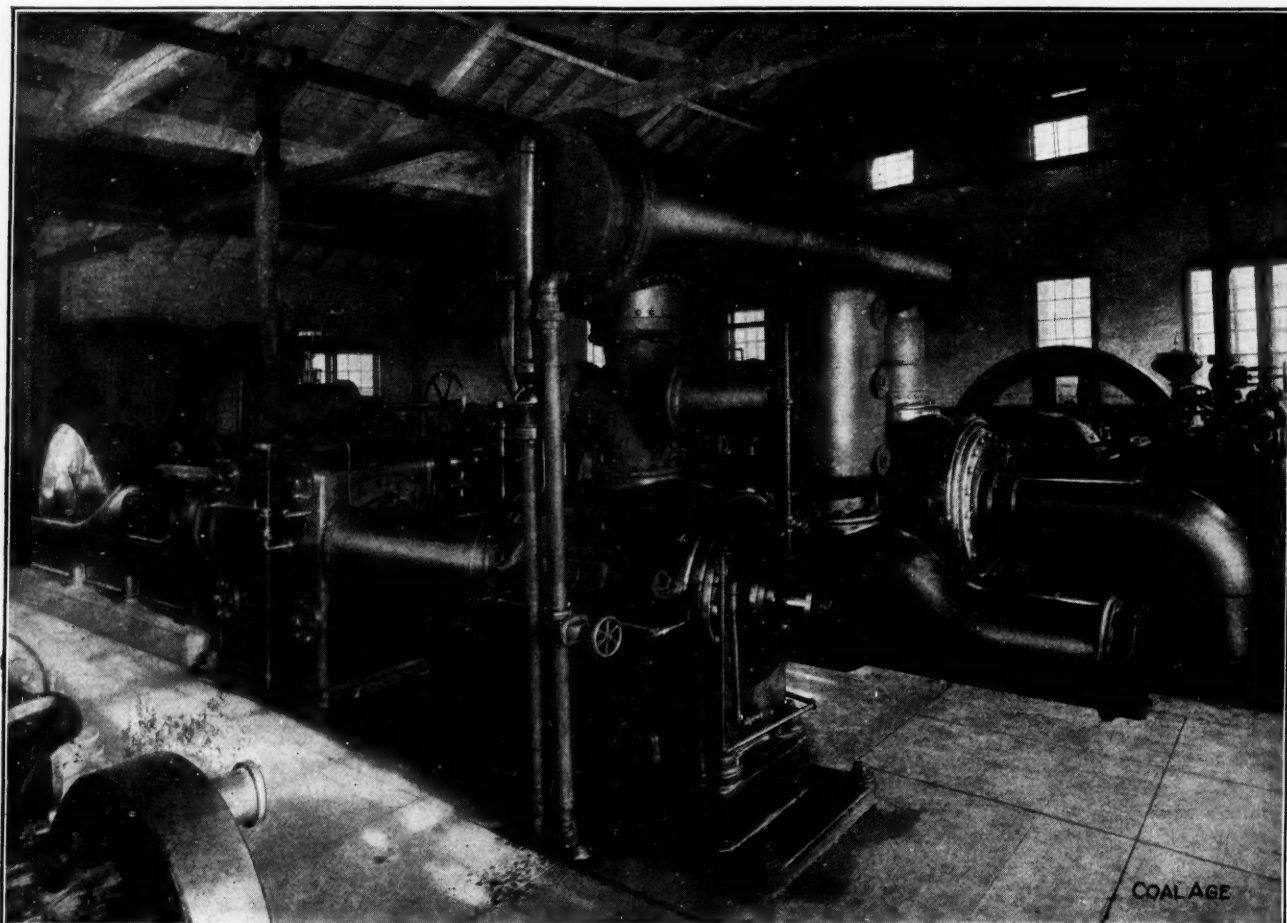


FIG. 1. COMPRESSOR INSTALLED AT THE NO. 5 COLLIERY OF THE LEHIGH AND WILKES-BARRE COAL CO.

to the coal cutting or pumping at the working face, that from the thermodynamic standpoint no figures of high efficiency can possibly be secured.

In spite of the many losses which the ingenuity of man has never succeeded in stopping, there are numerous others which are capable of elimination either in total or in part. That installation, then, which cuts down these needless wastes to a minimum may, by comparison with other plants erected for the same purpose, be justly and rightly termed economical. It is the purpose of this article to describe four plants coming under this category

supplied for the last 8 years by an Ingersoll-Sergeant duplex compressor. This machine is provided with simple Meyer valve steam cylinders and two-stage air cylinders compressing to 100 lb. It has been kept running 24 hours a day since installation, and is now being rebuilt preparatory to being put again into regular service.

A new compressor, shown in Fig. 1, which was installed a year ago, was built by the Ingersoll-Rand Co. It is of the duplex type with Corliss steam cylinders 28 and 42 in. in diameter, hurricane air cylinders 37¼ and 22¼ in. in diameter, respectively, while the common stroke is 36 in. The capacity at 100 r.p.m. is 4206 cu.ft. of free air per minute compressed to 100 lb.

\*11 Broadway, New York.



The steam cylinders are fitted with a type of Corliss valve-gear, claimed by the makers to be highly efficient and nearly silent. This latter claim is well borne out by the smooth, quiet running of the machine, the only noticeable sound being the slight clicking of the relief gear and the sucking of the dash pot. The usual objectionable hammering of the drop rod hook on the dash-pot cover is entirely absent.

#### THE CRANK CASE FORMS THE OIL RESERVOIR

The crank end of this machine, being wholly inclosed, provides a reservoir for a continuous oiling system for all the bearings except the valve-gear. This saves much time on the part of the attendant and is economical of oil,

caught on baffles and drained into a small tank placed on the foundation.

The amount of moisture drained from the air by this device will depend on the percentage of saturation of the air before entering the compressor and the temperature at which it leaves the inter-cooler.

It has been demonstrated that the capacity of air to absorb moisture increases directly with the volume, regardless of pressure, and that it practically doubles with every 250 deg. F. increase in temperature.

To take for illustration an actual case, in order to show the efficiency of the device, a two-stage compressor designed for 90-lb. terminal pressure at sea level will carry about 27 lb. gage, or nearly three atmospheres ab-

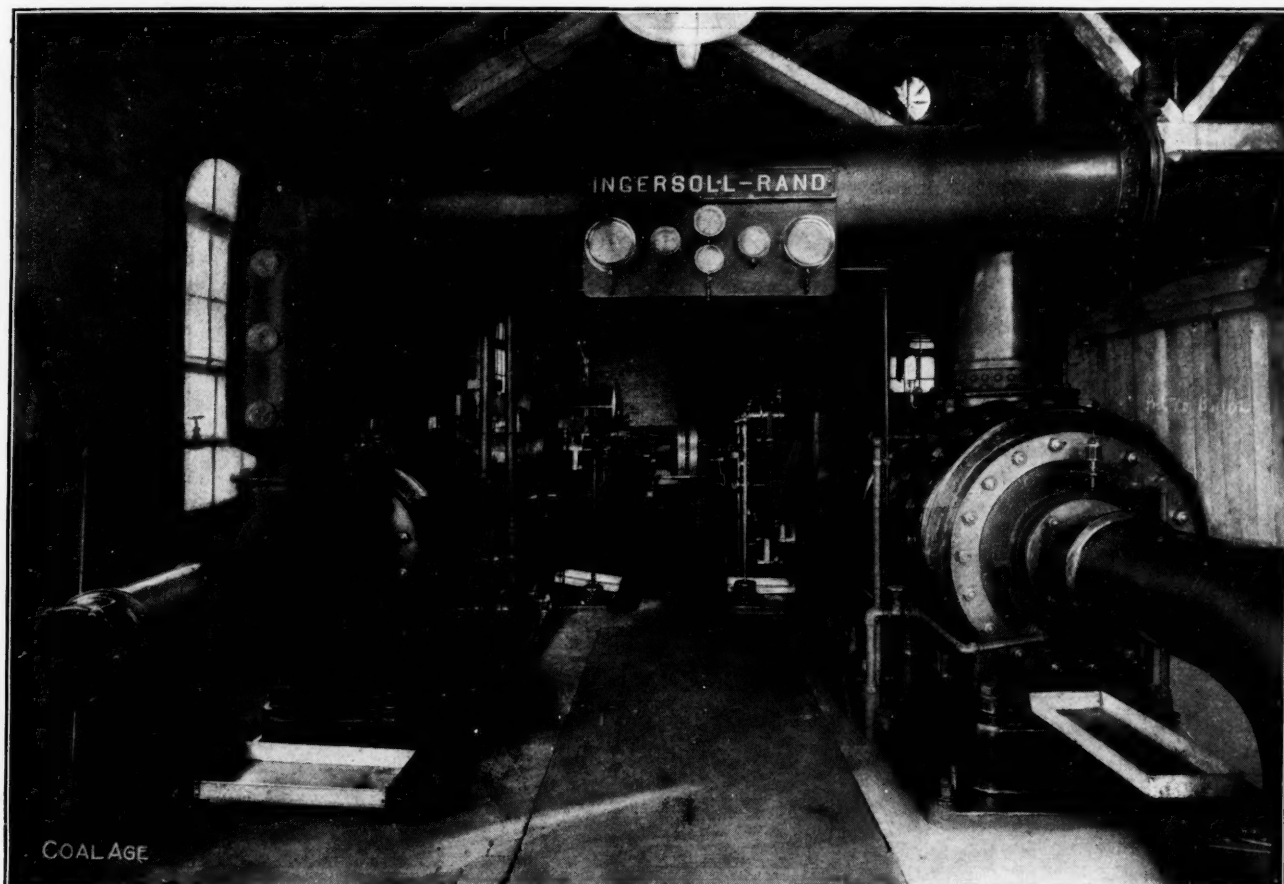


FIG. 2. A COMPRESSOR AT THE PLANT OF THE KINGSTON COAL CO., AT KINGSTON, PENN.

besides producing a cleanly machine with pleasing lines.

The air-valve gear is of a well known but unique type. The inlet air is drawn from a conduit beneath the engine-room floor through a hollow piston rod into a hollow piston, each face of which contains a valve of a continuous-ring form. These valves travel backward and forward with the piston and are opened and closed by their own inertia, consequently there is an entire absence of outside valve-gears, springs, etc., and no adjustments are required. The outlet valves are of the simple poppet type.

The air upon leaving the low-pressure cylinder passes through an inter-cooler of the usual surface condenser construction, from whence it passes through a trap in which the moisture which has condensed in the inter-cooler and hangs in the air in the form of a vapor, is

soluble in the inter-cooler. This will give a temperature of about 240 deg. F. on leaving the low-pressure cylinder, if the intake temperature were 60 deg.

Assuming that the air on entering the compressor is in a saturated condition, the fact that its volume has been reduced by compression to nearly  $\frac{1}{3}$  would mean that nearly 66 $\frac{2}{3}$  per cent. of this moisture would be precipitated, provided the temperature be reduced in the inter-cooler to 60 deg.

This is wherein lies the usefulness of the inter-cooler. But although this amount of moisture is given up by the air, it is not all precipitated, but the greater part hangs in the air in the form of a mist, and in the average installation is carried over into the high-pressure cylinder, where it is again taken up by the air, owing to the heat of compression, thus causing a loss of power, be-

sides trouble in the pipe line and at the points where the air is used. With the form of trap just described, nearly all of this moisture is caught and drained off.

Of course, the ideal conditions would be to extract all of this moisture before the air enters the compressor. This, however, would be impossible without a refrigerating plant. Much can be done, however, by taking the air from the coolest point possible, not from the inside of the engine room, or by installing some form of pre-cooler, which might be so designed as to clean the air as well as lower its temperature.

#### A UNIQUE AIR CLEANER IS EMPLOYED

A unique form of air cleaner is placed on the inlet to

high & Wilkes-Barre Co. therefor, the device having been constructed by their engineers. It is, of course, impossible to put down in figures the saving realized by such an apparatus, its operation being in the nature of a preventative rather than a cure. Some such cleaning device should, however, form a part of every up-to-date compressor installation.

The air from this machine is used to operate underground hoisting engines during the day, and at night a single pump for unwatering the mine, which takes the full capacity of the compressor, is operated. The main pipe line is, at present, 4 in. in diameter, but is to be increased to 6 in. in diameter to take care of the increased capacity afforded by the second machine.

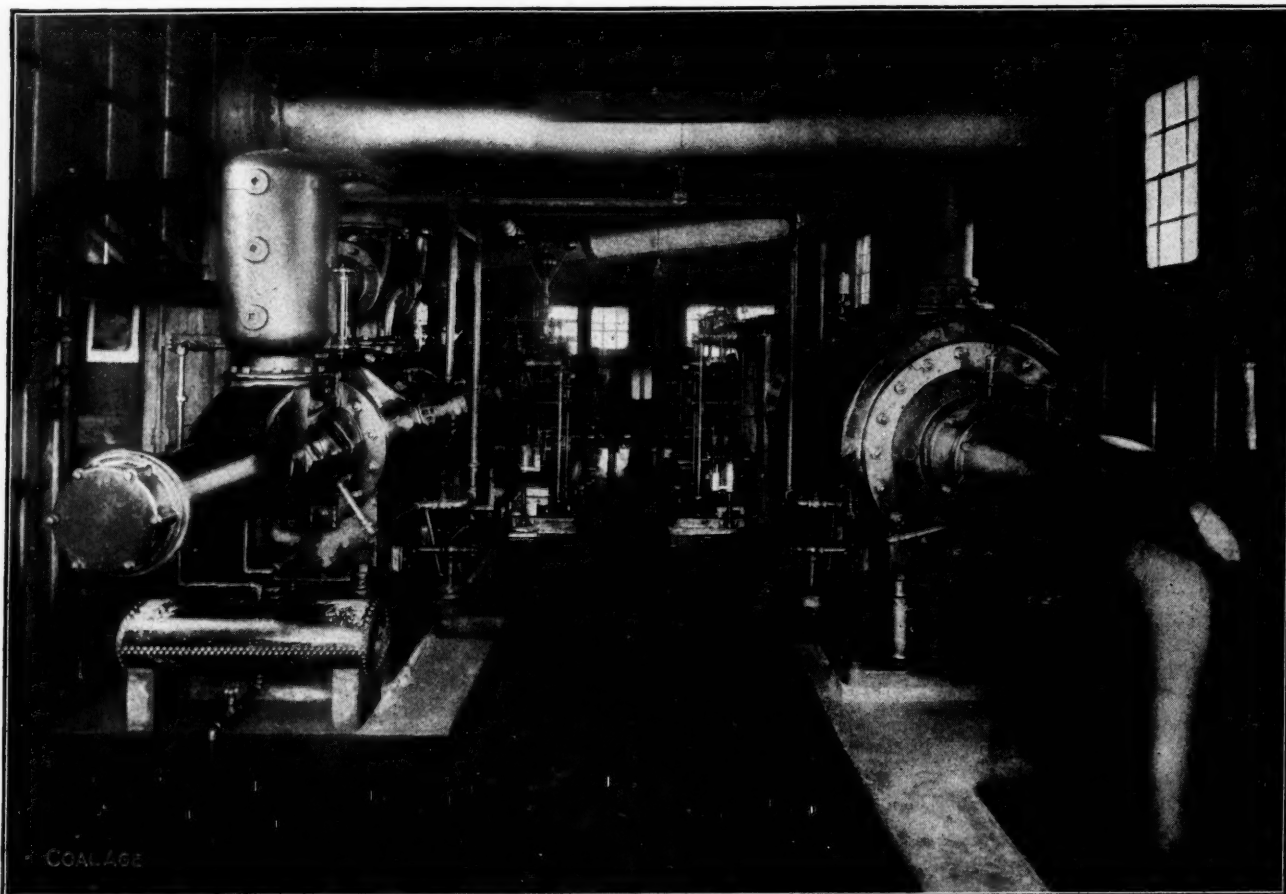


FIG. 3. COMPRESSOR INSTALLED AT THE DODSON MINE OF THE PLYMOUTH COAL CO., PLYMOUTH, PENN.

this machine. This is constructed of concrete and consists of a pit or box a little below the level of the engine room. A cover is placed over this box provided with openings so screened as to exclude large particles of foreign matter. The bottom of this chamber is filled with a heavy oil, just above the surface of which is placed a horizontal pipe provided with a long slot on the under side with one end closed and the other connected with the compressor intake conduit.

The air in passing to the compressor suction impinges more or less on the oil in the basin, leaving behind much dust and grit which would otherwise be carried over into the machine to the detriment of the valves and pistons. The oil can be easily removed and renewed as found necessary.

The use of this cleaner is of great benefit to the proper working of the compressor, and credit is due to the Le-

#### BUT LITTLE STEAM IS USED

The engineer in charge made the assertion that his compressor used little if any more steam than the older machine of about one-half its capacity; and this in spite of the fact that the steam pressure fluctuates anywhere between 80 and 100 lb., so that the engine at times runs practically without cutoff.

A compressor of the same type but slightly smaller, was installed two years ago at the plant of the Kingston Coal Co., at Kingston, Penn., to take the place of two straight-line tandem-compound compressors with a combined capacity of 5000 cu.ft., which were installed some years before.

The new machine shown in Fig. 2 has a rated capacity of 3336 cu.ft. at 120 r.p.m., compressing to 100 lb. It easily takes care of this load, but owing to the increased

use of air in the mine, another compressor of the same type and design is to be installed.

#### A BATTERY OF RECEIVERS IS EMPLOYED

The air is piped to a battery of receivers, consisting of three 42-in. by 34-ft. cylindrical tanks coupled together. It is led in at the top to a pipe connection in the center of the battery. Provision is made for the new compressor when installed at the other end of the system.

This air-storage system was installed by the coal company to take care of the fluctuations of the load, and worked out well in practice. The air is used for pumps and hoisting engines underground.

This compressor is installed beneath a coal breaker, and consequently under unfavorable conditions, the intake being only protected by wire screens. In spite of this fact, however, it has not been necessary to renew any of

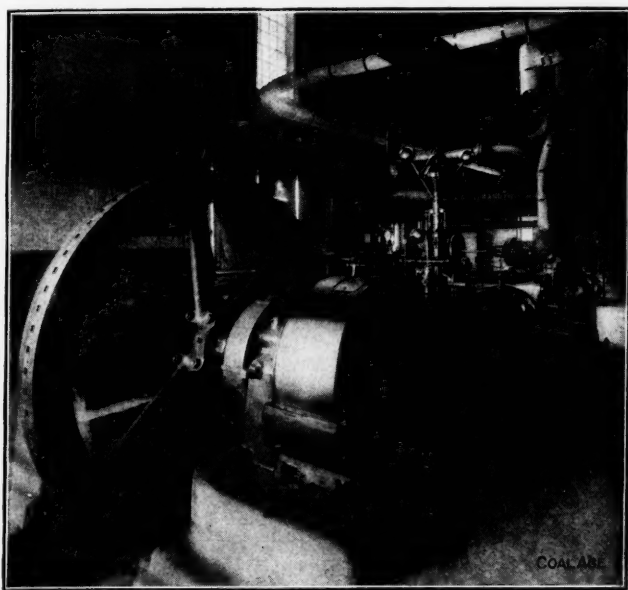


FIG. 4. COMPRESSOR AT GAYLORD MINE, PLYMOUTH, PENN.

the air-inlet valves or valve springs since installation. The machine runs 24 hours per day, and has been speeded up to 125 r.p.m. for hours at a time.

At the Gaylord mine of the Kingston Coal Co., at Plymouth, Penn., another machine of the same type shown in Fig. 4 is installed for operating the mine hoist. This compressor has a capacity of 2000 cu.ft. at 134 r.p.m., and runs so smoothly that the writer was able to balance a nickel on edge on top of the main frame, while the machine was operating at 125 r.p.m. This compressor takes the place of an old Ingersoll-Seargent straight-line machine.

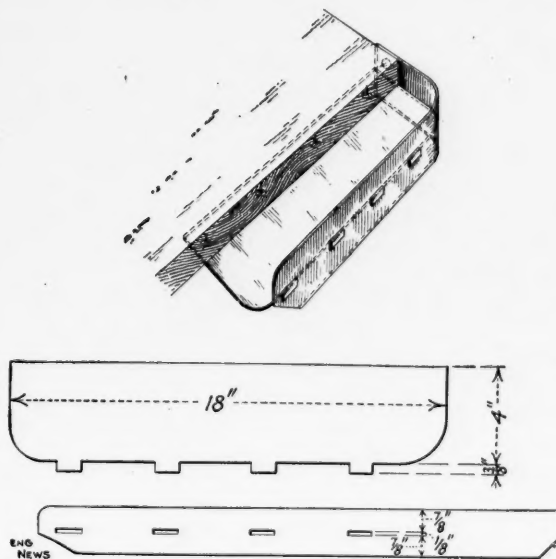
At the Plymouth Coal Co.'s Dodson mine, also in Plymouth, Penn., a compressor of the same size and type as that installed at the Kingston plant was put in to take the place of a 10-year-old duplex machine, a relic of former days. This compressor has run constantly for the last year and a half, generally being speeded up to about 125 r.p.m., at which speed it was possible for the writer to balance a nickel at the edge of the main frame, the same as was done at the Gaylord mine. This speaks much for the thorough manner in which the foundations were put in as well as the fine balancing of the machines themselves.

This compressor, about a year ago, was put to a rather unique use. Fire had broken out in the workings, and it was found to be impossible to get any fire-fighting apparatus within reach of the flames, owing to the noxious gases present. This difficulty was overcome by directing the full capacity of the compressing plant, which includes a small straight-line machine beside that above mentioned, into the workings and forcing the gases back until the fire-fighters were enabled to get near enough to extinguish the fire. This illustrates another use for compressed air in the coal mines, although it is one to which we hope it will be seldom necessary to resort.

In all of the above mentioned plants, the steam pressure fluctuates considerably. This does not, however, appear to interfere with the proper operation of the Corliss compressors, but makes it impossible to obtain any actual record of economy. The writer was unable, furthermore, on account of the brevity of his visit, to secure any data on the economical utilization of compressed air in the coal mines.

#### A Convenience for the Draftsman

Frank W. Miller, 422 Crane Ave., Detroit, Mich., has made a device illustrated herewith, which proves very useful to catch pencils, erasers, dividers, etc., which might otherwise be swept off the edge of the board and buried under the drawings below, in case the draftsman has



CARDBOARD TRAY FOR HOLDING DRAWING UTENSILS

much shifting of layouts and reference drawings from the top of his drawing board to his reference table at the side. The device consists of two pieces of heavy cardboard, cut as shown in the sketch. The tabs left on the piece forming the bottom fit into slots in the side piece, which is held quite firmly by mashing or spreading the projecting edges of the tabs. The bottom is tacked to the under side of the drawing board along the right-hand edge, while the side piece is bent around and fastened at the upper corner, as shown in the sketch. The whole thing is below the level of the board. During the last six months, Mr. Miller says, it has saved him many a search for buried instruments.—*Engineering News*.



# The Pittsburgh Coal Bed

BY W. G. BURROUGHS\*

*SYNOPSIS*—A description of the Pittsburgh coal seam in all the four states in which it makes its appearance. The author, in drawing his statements from various official sources, enables us to get a good idea of the seam as a whole.

The Pittsburgh coal seam is the most valuable coal bed in North America. It was named by H. D. Rogers and his associates of the First Geological Survey, of Pennsylvania, in honor of the city of Pittsburgh, though it extends over parts of West Virginia, Ohio and Maryland, as well as Pennsylvania, in all of which states it is an important source of fuel. The workable coal area in the Pittsburgh seam is estimated by White at from 6000 to 7000 square miles. The bed has an average thickness of 7 ft. over an area of about 2100 square miles and it contains in all an estimated tonnage of 9,641,792,907 short tons.† It occurs at the base of the Monongahela formation of the Pennsylvania (Upper Carboniferous), series.

## THE TIME NEEDED FOR DEPOSITION OF COAL SEAM

The approximate length of time required for the accumulation of the vegetable matter from which the seam is composed, has been estimated by G. H. Ashley.‡ He states that 1 foot of peat can be laid down at the surface in 10 years. This will later shrink to 3 in., due to loss of moisture. It is estimated that it loses by partial decomposition about  $\frac{1}{4}$  of the vegetable matter, but as its specific gravity increases to about twice what it was before compression, the original 3 in. will be compressed to about  $\frac{1}{2}$  of  $\frac{3}{4}$  of 3 in., or  $1\frac{1}{8}$  in., and probably less in the deeper bogs. Thus, about one foot in a century is roughly the rate of accumulation of buried peat.

A cubic foot of peat from the lower part of the bed will weigh on an average about 50 lb. Due to loss of water this weight will be reduced  $\frac{1}{3}$ , and the remainder will be decreased a further  $\frac{1}{3}$  by distillation, leaving, roughly, 25 lb. One cubic foot of coal from the Appalachian field will weigh on an average about  $87\frac{1}{2}$  lb. "Therefore, to make one foot of such coal will require  $3\frac{1}{2}$  ft. of well compressed peat.

Ashley writes that "the factor 3 has been selected as representing not the shrinkage of the whole bed, but the number of feet of well compacted, deeply buried old peat necessary to produce one foot of bituminous coal of the general character of the Pittsburgh coal of Pennsylvania. Applying this to our estimate that one foot of such peat requires a century for its deposition, 300 years is the time necessary to lay down one foot of bituminous coal. At this rate the Pittsburgh bed, where 7 ft. thick, required 2100 years for its accumulation, and 4000 years in its best development in the Georges Creek basin of Maryland."

## CHARACTERISTICS OF COAL BED

Over most of the large territory covered by the Pittsburgh bed, the coal has the following characteristic struc-

ture: \* roof coal, over-clay or draw slate, breast coal, parting, bearing-in coal, parting, brick coal, parting, bottom coal.

## "ROOF COAL" AND "OVERCLAY"

The top bench of the seam is known as the "roof coal" and is made up of a number of thin layers, each 2 to 12 in. thick, separated from one another by shales, or clays, of varying thickness. Some of the layers of "roof coal" are clean, others contain much dirt and various other impurities.† In number, these thin coals range from one to eight, sometimes more, their total thickness seldom exceeding  $3\frac{1}{2}$  to 4 ft. The separating slates and clays sometimes are only half as thick as the coals, while in other places, they are often 2 or 3 times thicker than the coal.

The "overclay," or "drawslate," is an impure fireclay, varying in thickness and at times almost disappearing, and again in other regions, thickening up to 2 or even 5 ft. It is usually mottled and has many slickensides, rendering it dangerous, as large pieces of it will drop from the roof without warning. Therefore, it is generally taken down at once.

## THE "BREAST COAL"

The "breast coal" is often, also, called the "main bench," and is usually the most important and valuable division of the whole Pittsburgh bed. In the Pittsburgh region, this section is generally about 3 ft. From this district it thickens gradually up the Monongahela, attaining a maximum of 6 ft. at Brownsville, while to the eastward in the Georges Creek and North Potomac basin, of Maryland and West Virginia, it increases in thickness still more, reaching  $7\frac{1}{2}$  and even 10 ft.

The top of the "breast coal" is nearly always of a boney nature for a thickness of 1 to 4 in. Frequently, this boney portion must be separated and rejected in mining; but even where this is not required, the top of the "breast coal" is distinctly harder than the rest, and inclined to show cannelly structure. As the Pittsburgh seam extends westward to the Ohio River, this "breast coal" member in certain districts thins to 2 ft. in thickness.

## "BEARING-IN BENCH"

The "bearing-in coal" has been so named by the Monongahela River miner, because in mining operations, the undercutting of the "breast coal" is made in this layer, the latter being wedged or blown down, and the "brick" division subsequently taken up. The "bearing-in coal" is usually brilliant and pure. It varies in thickness from 3 to 6 in., and is inclosed by two thin parting slates, almost exactly alike in color and structure. In the region between Pittsburgh and Brownsville, these slates are  $\frac{1}{4}$  to 1 in. thick, and of a dark mottled gray color.

In West Virginia, they are generally a dark bone, and will sometimes burn with the coal.‡ The persistency of

\*129 North Professor St., Oberlin, Ohio.

†Ohio Geological Survey, Bulletin 9.

‡"The Maximum Rate of Deposition of Coal," "Economic Geology," Vol. II, Jan.-Feb., 1907.

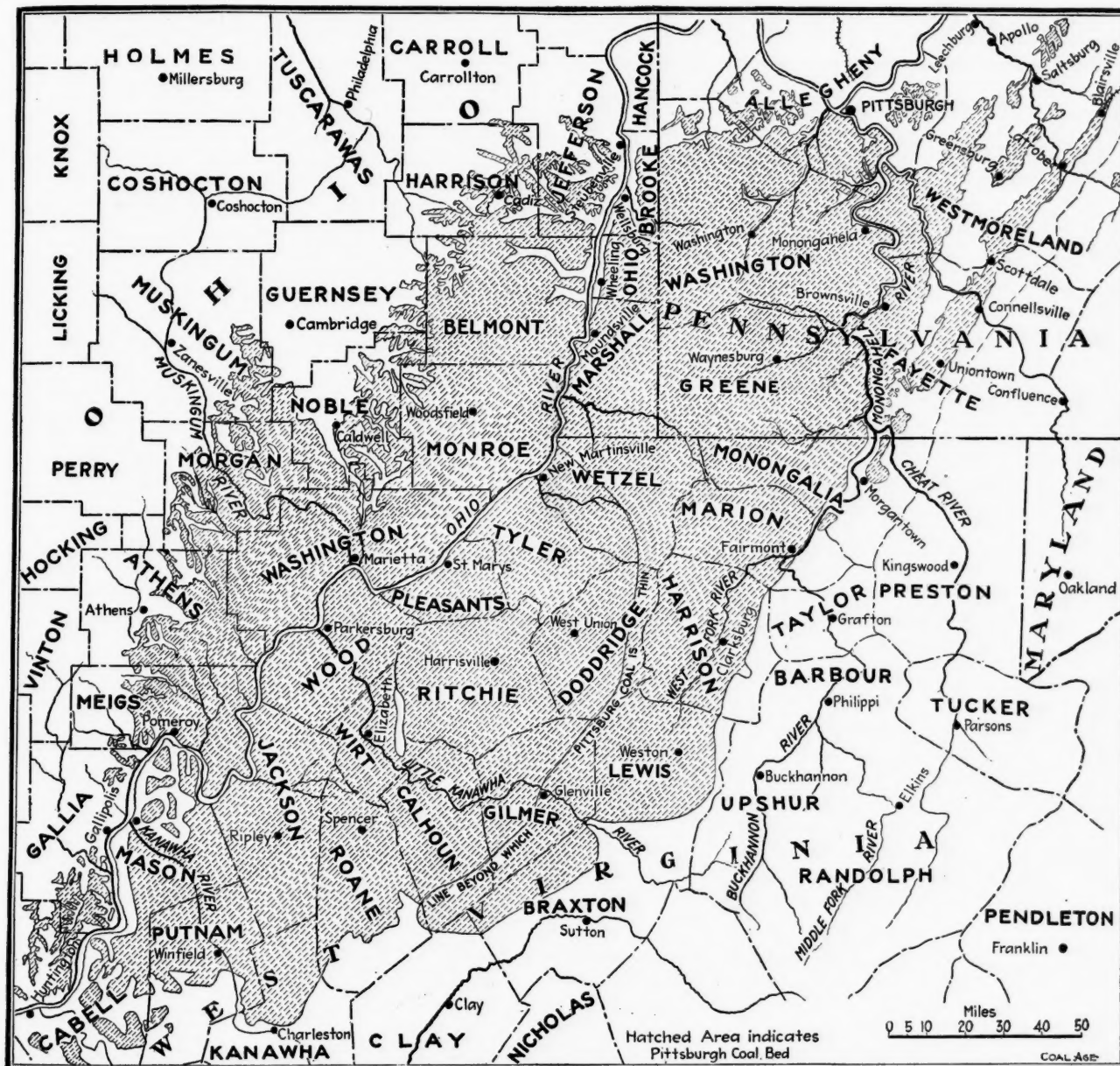
\*Ohio Geological Survey, Bulletin 9.

†West Virginia Geological Survey, Vol. II, Part 3, pp. 164-204.

‡West Virginia Geological Survey, Vol. II, Part 3, pp. 164-204.

these twin slates over all the regions drained by the Monongahela, east to the Georges Creek and North Potomac field, and west to Wheeling, Bellaire and the neighboring regions of Ohio, is one of the remarkable features of this coal bed. When, however, the areas of this coal south of the Little Kanawha River in West Virginia and

out in oblong rectangular blocks, like common bricks. It is generally about one foot thick. The parting which separates the "brick coal" from the "bottom coal" is always present along the Monongahela from Brownsville to Pittsburgh; and it is also represented in the Georges Creek and North Potomac field, but in the Fairmont re-



MAP OF THE HORIZON OF THE PITTSBURGH COAL BED IN PENNSYLVANIA, WEST VIRGINIA AND OHIO

The Maryland deposit is excluded. It will be noted in the illustration that in West Virginia there is a line which shows where the Pittsburgh bed becomes thin and of little commercial value. While some of the deposits west of that line in Ohio are of considerable value, many are utterly valueless, and some are mere traces. In other places, the bed is missing and its horizon alone can be determined. As this is a map covering the horizon of the coal bed and not its actual presence, the profitable coal area, especially in Ohio and West Virginia, will be considerably smaller than that shown.

west from the Muskingum in Ohio, are examined, these twin slates are not found, or if represented, are no longer recognizable as the Monongahela partings; but the "roof coal" and the "overclay" appear to be present."

#### THE "BRICK COAL"

The "brick coal" comes next beneath the lower of the twin slates. It owes its name to the fact that it comes

out in oblong rectangular blocks, like common bricks. It is rarely present, the bed in that section generally being undivided below the "bearing-in coal."

The "bottom coal" is from 12 to 20 in. thick along the Monongahela in Pennsylvania. It contains many thin, slaty, sulphurous laminae.

I. C. White gives the following section, taken near Scott Haven, Penn., as typical of the Pittsburgh bed, as it occurs over large areas:



## THE PITTSBURGH BED AT SCOTT HAVEN, PENN.

	In.
Coal, several films of earth.....	3½
Shale, black, earthy.....	2
Coal.....	2½
Shale gray, streaks of coal near top.....	11
Bone, a hard, dull, impure, coaly layer.....	1
Coal.....	2½
Shale, black.....	0½
Coal.....	1½
Shale, black, coaly.....	1
Coal.....	3
Shale gray, with irregular coal streaks.....	4½
Coal, compact, free from "binders".....	9½
Slate, with coal streaks.....	1½
Coal.....	2½
"Overclay," impure, fireclay, light gray above, getting browner and then a much darker gray with coal streaks of irregular shapes, especially toward the base.....	
"Breast coal" (with 1½ in. of bone at top, and next 10 in. harder than the rest of the bench).....	
Shale, dark, grayish brown, mottled.....	0½
"Bearing-in coal," clear and brilliant.....	0½
Shale, dark, grayish brown, mottled.....	0½
"Brick coal," clear and brilliant.....	11
Shale parting.....	0½
"Bottom coal" { Coal with few thin dirt layers.....	
{ Shale.....	
{ Coal, bright and clean.....	
Total thickness of Pittsburgh bed.....	
	10 ft. 9½ in.

In Athens and Gallia Counties, Ohio, a marked change occurs in the Pittsburgh bed. The well known structure of the seam, described above, is wanting. In its stead, we find a threefold division. This consists of an "upper bench," and a "lower bench" of coal separated by a layer of clay or shale. Usually the "Lower bench" is the more important, and in places it is the only one mined; but it is not always the most important, as is shown in the following section.

## PITTSBURGH COAL SECTION AT SHARPSBURG, ATHENS COUNTY, OHIO

	Ft.	In.
Shale, unmeasured.....		
Upper bench { Coal.....	4	0
{ Bone coal.....	0	2
{ Coal.....	0	4
Clay parting.....	1	0
Lower bench { Coal.....	2	10
{ Pyrites parting.....	0	0½
{ Coal.....	0	8

## SECTION OF THE SAME SEAM AT BLADEN, GALLIA COUNTY, OHIO, ON THE BANK OF THE OHIO RIVER

	Ft.	In.
Shale.....	2	0
Upper bench coal.....	0	4½
Clay.....	1	0
Lower bench coal.....	2	9

Ohio Geological Survey Bulletin 9.

Usually, the structure is more complex than is shown in this section.

The structure of the Pittsburgh coal in Ohio presents two distinct phases, as follows: In the eastern counties

it is usually normal and similar to that of the great fields east of the Ohio River; farther southwest in Ohio, as has been stated above, the structure is different, but it is persistent in that territory. Between these two modes of structure are intermediate, transitional forms, as the Ohio Geological Survey points out.

The Pittsburgh coal is also remarkable for the number and size of its "clay veins," which penetrate the bed in every region, whether along the Monongahela, or the Great Kanawha, 200 miles distant. In some districts, these "clay veins" are more frequent than in other regions, but they occur in all. I. C. White regards them in most cases as being due to earth movements which squeezed up the underclay into and often through the over-lying coal.

An analysis of the Pittsburgh coal from a mine in Belmont County, Ohio, which county has a larger quantity of that coal than any other county in that state, is here given, taken from the reports of the Ohio Geological Survey.

## ANALYSIS OF PITTSBURGH COAL FROM BELMONT COUNTY, OHIO

Ultimate		Proximate	
Carbon.....	71.45	Moisture.....	3.39 (a)
Hydrogen.....	5.21	Volatile matter.....	36.84
Oxygen.....	11.27	Fixed carbon.....	51.91
Nitrogen.....	1.24	Ash.....	7.86
Sulphur.....	2.97		
Ash.....	7.86		
	100.00		100.00
Calorific value.....		(a) = moisture in air-dried sample about 3%.....	7217 calories.

Prof. N. W. Lord, of the U. S. Geological Survey, found the average calorific value of samples of Pittsburgh coal from Pennsylvania to be 13,557 B.t.u.

Pittsburgh coal is a leading fuel for the production of illuminating gas. For the manufacture of coke, Pittsburgh coal stands second to none. The average of a large number of analyses of Pittsburgh coal and coke of the Connellsville basin, is here given:

## CONNELLSVILLE COAL AND COKE

	Coal	Coke
Moisture.....	31.04	0.184
Volatile matter.....	61.97	0.552
Fixed carbon.....	5.77	88.726
Ash.....	1.22	9.993
Sulphur.....		0.533
Phosphorus.....		0.010

22nd. Annual Rept., U. S. G. S., p. 176.

## Reporting on Coal Properties

BY FRANK HAAS\*

**SYNOPSIS**—A report should tell the person who is to receive it all that he needs to know and no more. A busy man won't read a long disquisition even about his own property, and may be unwilling to hunt up all the abstruse terms the engineer may choose to use. Every report should be attractive and facts should be mainly conveyed by maps, diagrams and photographs rather than in the most graphic of language.

Probably every engineer at some time in his career will have to make a report on a coal property. The work well done will bring quicker and larger reward than any

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Note—Article prepared to be read at the meeting of the West Virginia Coal Mining Institute, Charleston, W. Va., Dec. 8-10, 1913.

other, and every mining engineer should study this feature of his profession. Experience, it is true, is the best help to that kind of work, but there is a way of profiting by other people's efforts which will go a long way toward replacing such deficiency.

### WHAT THE REPORT IS TO BE USED FOR

The engineer should have a clear understanding of the object of the report so that he will not waste his time and the time of those who read it by introducing needless detail. It is necessary to know if the property in question is to be purchased or sold, whether it is to be exchanged for other lands, whether it is to be considered as an immediate operating property or whether it is to be taken by bankers as a basis for a bond issue.



### A REPORT TO A BANKER

A report made to a banker should be different from one made to a president or general manager, who perhaps may contemplate immediate operation. The bankers want to know whether the property will earn interest on the bonds which they are floating or which have already been issued and whether it will earn a sinking fund for retiring the bonds and a margin large enough to make investment amply safe.

If your information and judgment warrant it, the quickest and shortest way of convincing the banker will be most acceptable to him. Give the banker no details which he does not understand. Ordinarily, he knows nothing of anticlines and synclines or butts and faces, and so on. The chances are that if he does not understand, he will not admit it. Anything in a report which is not plain or is not understood is a weakness. It does not matter whether it is your fault or not, the damage is done and the world and modern business does not stop to rectify personal grievances. However, by all means do not underestimate the banker in his knowledge of the coal business or you will regret the day, for some time you will meet a wise one who will ask questions which are interesting and would be decidedly embarrassing if you did not fortify yourself with a supplementary report of detail facts.

### REPORTS TO MANAGERS

If, on the other hand, you make a report to your president or general manager, the proposition is one of an entirely different nature. Perhaps as you should have previously determined, you are only to accumulate the facts, and if so, devote yourself to this alone; your opinion will probably be asked for some time, so it isn't necessary to intrude it until the proper occasion. This kind of a report is the most difficult of all to make.

To place all the facts of a proposition in such a manner and so concisely and plainly to a second party that he can form a definite opinion without further question or investigation, is a success indeed. Probably you may have to know your man as well as your property and in such a case it is well to put yourself in the other man's place and see if you can, in a theoretical way, formulate an opinion from the facts in hand. If you are sincere and conscientious in the criticism of your own work, and find it satisfactory, the probabilities are that your effort is a success.

### CARE IN ASCERTAINING FACTS

A common error is lack of discrimination between facts and opinion. There is nothing that will so completely destroy an otherwise good report as an inadvertent statement which is offered as a fact that cannot be fully substantiated. I have seen reports in which there was apparently no thought or idea of discrimination. A report recently passed through my hands covering, in a general way, several hundred thousand acres in eastern Kentucky from information apparently gathered in two weeks' time.

In this report nine seams of coal were identified and the correlation carried without a hitch or a question for over one hundred miles. It was a decidedly remarkable achievement if it were true, yet the report gave no indication other than that its statements were proven facts. Yet the man, I feel sure, was sincere in his own mind, but did not realize the mischief he was making for others following in his path.

I have in mind now a property on which twelve separate reports have been made and the opinions formed after a careful study of them would vary widely; in fact, the property would hardly be recognized except for the geographical names. The character of coal was variously described in the several reports as if it varied from semi-anthracite to coking coal, all this occurring without any desire on anyone's part to willfully deceive, but from a lack of discrimination between fact and opinion, or gross ignorance, for the facts in this case were so very apparent and so readily available.

Considerable time and labor are consumed in weeding out such inaccuracies. A statement once made must be either substantiated or proven wrong and nothing must be left for interpretation, for this is the real object of the report. It is far easier to go into a virgin field and cover the proposition concisely and briefly than to make a report when the territory has previously been described in an inaccurate manner.

### PREJUDICED OPINION

Another very important matter to be considered is that of prejudice. The coal fields of the Appalachian system are fairly well known and those who have followed the profession are more or less familiar with the entire system and, by hearsay, publications or otherwise, have ideas in regard to the various fields and in some cases even positive opinions.

It is a difficult thing to pull away from such ideas or opinions and constant vigilance is needed to keep these preconceived ideas from entering into our estimates, but it is essential that they should be excluded. It would be a clever writer, indeed, who could incorporate a prejudice and not have it discovered. But this failing is common and most reports are contaminated in this way.

A prejudice may be in the right direction, but if it is discovered it will naturally throw the reader in an opposite direction and the injury will be threefold, first to the reader of the report, second to the property and finally to the writer himself. And it is usually a hopeless case, for once it is known that a person is prejudiced, argument is considered useless and generally not offered.

Of course, there are many reasons why these prejudices occur and many excuses for their existence. For instance, one may be called upon to report on a property belonging to one corporation and subsequently required to do the same on an adjoining property, which may belong to a competitive company, and it is almost against human nature to think that the statements of one's first report would not affect those of the second.

### FIND OUT WHAT FACTS ARE NEEDED

It has been said heretofore: "Know your man." This adage may be used here to express that we should understand just what he wants to know. He is paying his money for a record of facts and perhaps an opinion on a piece of property and it is your duty to furnish him with the information that he wants and in the way he wants it. It is sometimes surprising to hear some of the questions that are asked, simple but entirely to the point, which would not have occurred to the engineer had the suggestion not been put.

It becomes almost a habit among those in the same profession not to discuss or even mention things which are to such profession self-evident facts, but which may

be to others unheard of and unknown. It is only a short time ago that I had occasion to travel over a considerable territory with an owner of a large property. The man was serious and thoroughly interested—he had his money invested and wanted to know in a manner that he could understand just how much coal he had, what kind of coal it was and what kind of market the coal would suit and where that market was, and so on.

Those who have been through the mill can appreciate how tedious it becomes to answer the fire of questions that can be put in a week's trip. But after all, it might almost be said that he who answers or tries to answer those questions learns as much as the man who asks them, in that it gives ideas as to what people who are not acquainted with the coal business want to know and what facts should be covered in a report.

#### A BRIEF REPORT WITH EXTENSIVE EXAMINATION

I have in mind now another man for whom I have made numerous reports. At first these reports were patiently read through; after a while I found that the last page was read first and the fore part afterward, so adjusting the reports to the conditions, the last page was submitted first. This proving satisfactory for a time, I found that the rest of the report was only indifferently read and more probably not read at all; so finally, to perfect the matter still more, the rest of the report was omitted, which apparently was most satisfactory of all. It is a fact that the largest acreage, or deal, that went under my observation was based on a report that had less than two typewritten pages. But don't assume that the work wasn't done; the supplementary report, though not submitted, was quite complete and handy should a critical moment have arrived.

#### MAPS SHOULD BE REDUCED TO MANAGEABLE SIZE

Having pointed out that a report should be brief, concise and without prejudice, it might also be added that it should be attractive and pleasing in its arrangement. Anything that can be illustrated by a map or a diagram should be so presented, not only for brevity, but for quick understanding. A map is far more comprehensive than any description could be, diagrams of sections are more easily read and a few photographs of characteristic features add greatly to the value and attractiveness of a report.

For the purposes of a report, a map is merely an illustration, and such a scale should be selected that the entire proposition can be grouped at a glance; by all means avoid a map which requires a special table to display it; it should be rather one that a person can hold in two hands and comfortably see it all. Avoid unnecessary detail, but bring out the essential features prominently; should some detail require a larger scale, provide another map, which is a section of the whole, large enough to demonstrate it properly, but maintain a uniform size of map if possible. The facilities for enlarging or reducing maps are or should be available in any engineer's office, and there should be no excuse for maps not being reproduced in the most attractive and convenient form.

Whatever the illustrations you may see fit to offer, by all means, make them neat in appearance. Any man who makes any pretense of being an engineer must be a draftsman, and there is nothing that will provoke criticism so readily as a careless or untidy map.

However, whatever the subject, whatever the object, make your report in such a manner that you will have no excuses to make, and the presentation will meet all your own conscientious criticisms. Then the probabilities are that your effort will be a success.

### Pulverized Coal

James Lord, president of the American Iron and Steel Mfg. Co., Lebanon, Penn., addressing the Engineers' Society of Western Pennsylvania, gave the following specifications for powdered coal for metallurgical uses: (1) The free and combined moisture must be expelled by artificial heat till their combined percentage falls to 0.5 per cent. (2) The coal must be pulverized so that 95 per cent. will pass through a sieve of 100 meshes to the square inch. Over 80 per cent. at the Lebanon works will go through a 200-mesh sieve. (3) The coal should have a high volatile content, not less than 30 per cent. (4) The sulphur should not exceed one per cent.

The cost of drying, pulverizing and transmitting the dust amounts to 50c. per ton of which the first two items cost a total of 40c. When pulverized coal in the furnaces is used, smoke is eliminated. Sometimes the coal catches fire in the storage bin, in which case the supply is stopped and the burning coal is fed to the furnace. There is no danger of an explosion under these conditions, in fact no explosions have been experienced at the Lebanon works.

William A. Evans, New England manager, Griscom-Russell Co., Boston, Mass., discussing the paper, stated that drying was not absolutely essential but effected a large economy. The dryer can only be eliminated where the pulverizers will permit moist coal to pass through them. If screens are used for the separation of the coal and fine material, they clog up immediately when fed with moist coal. Moreover, damp powder in the storage bin will coke almost solid and develop heat tending toward spontaneous combustion.

#### PULVERIZED SLACK COSTS AS MUCH AS MINE-RUN COAL

Coal cannot be taken from the cars, and be pulverized and delivered to the furnace for much less than 50c., certainly not for 10 or 12c., as has been stated. The cost of slack pulverized is about the same as that of mine-run which would be used on grate fires. Low-grade coal is no better suited to this class of furnace than to ordinary purposes. Much slag is deposited in the furnace by such coal and the furnace front has to be repeatedly opened to permit removal of the slag; thus the furnace is cooled, heat is lost and castings are ruined.

The entire combustion space should be free from any metallic surface. The failure to take this precaution is probably the reason why success has not been obtained in burning pulverized coal under boilers. Coal dust cannot be burned in brick checker-work because of its slagging qualities. In this department, therefore, it cannot compete with producer gas but in its proper field, the use of pulverized coal is 25 per cent. cheaper than the indirect process of turning coal to gas and burning the gas in a furnace. Coal is also about 60 per cent. cheaper than oil for furnace use.

Note—Pulverized Coal in Metallurgical Furnaces, Vol. 29, p. 362, October, 1913.



## BURNING IMPURE COAL

H. R. Barnhurst, engineer of the Fuller Engineering Co., Allentown, Penn., stated that by the use of special furnaces pulverized anthracite containing 25 per cent. ash could be burned, also coke breeze with 15 per cent. ash and even washery waste with 52 per cent. ash. He also stated that 4 B.t.u. can be saved per degree of pre-heating per pound of fuel when 50 per cent. excess air is admitted. In his belief the pulverization should produce a dust of which not less than 85 per cent. should pass the 200-mesh screens and not less than 95 per cent. the 100-mesh.

One pound of coal will evaporate 6 lb. of moisture in the fuel. One man can deliver the coal to a drier of 6 or 8 tons hourly capacity. One man can operate mills

stanced the use of West Virginia slack coal with 2.71 per cent. of sulphur, Pittsburgh coal with 1.28 per cent. and Illinois coal with 1.47 per cent.

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## Safety First Signs

A great many coal-mining companies are placing illuminated signs in their underground workings, with the idea of preventing accidents and thereby saving lives. As constructed today by the Electric Service Supplies Co., of Philadelphia, these signs are practically indestructible and necessitate but little cost for maintenance.

Mining companies can place such danger signs at any point where human life is in danger by exposed electric wires, switches, third rail, etc.



THESE DANGER SIGNS ARE PRACTICALLY INDESTRUCTIBLE



THE ROLLER-CURTAIN SIGN SHOWN ON LEFT ABOVE IS A NEW AND NOVEL TYPE. THE CURTAIN CONTAINS A NUMBER OF "SAFETY PRECEPTS"

capable of grinding the same amount of coal and delivering it finished in the bins. The repairs of dryer and mills will be less than 2c. per ton. The power including conveying and elevating will be about 17 hp. per ton of product per hour.

Large economies have been made over raw-coal firing and the use of coal in producers: In continuous furnaces for heating billets, 24 per cent; in openhearth producer-gas fired furnaces, 30 to 35 per cent; in puddling furnaces, 33 to 50 per cent.; in heating and busheling furnaces, 20 to 25 per cent.

I. W. Rawlins declared that coal with 2.05 per cent. sulphur had been used at Cananea and E. D. Barry in-

The very latest development in the construction of safety-first signs is the Keystone illuminated roller-curtain sign, shown in the accompanying illustration. This particular type is an educational feature with great possibilities. The curtain may contain any number of "safety precepts" covering an entire campaign, and conforms nicely in its adaptability to the modern safety idea.

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In a suit in Alabama it was contended that a man working about an air pump was asphyxiated by the air discharged. It was said that an explosion of the lubricating oil in the compressed-air pipes and receiver filled the pump cylinders with noxious gases and caused the man's death.



# An Analysis of the Commerce Law

BY SYDNEY A. HALE\*

*SYNOPSIS—There are probably few shippers who have little more than a mere superficial knowledge of the "Act to Regulate Commerce." In order to make the measure effective in all its ramifications, it was necessary to embody many unusual provisions. Thus the railroads are not the only ones who may be culpable of infringement of the law and the incautious shipper would do well to post himself on its intricacies.*

The prosperity of the United States, as of no other country, is dependent upon its transportation facilities. Business moves and has its being in this interlacement of steel, approximating a quarter of a million miles. Unless these avenues are kept open, community isolation and industrial disintegration would be inevitable—and swift.

With this power of financial life and death concentrated in the control of one agency, it was only natural that arrogance should creep in and the railways, for a time, forgot that, while in their strength they might crush, they would be buried eventually under the commercial havoc they wrought.

Individual states were the first to take up the issue with statutory curtailment of the railroads' license, but local regulation proved inadequate. The national government, acting under the powers of the commerce clause of the Constitution, then stepped in. With the Constitutional grant that Congress shall have power "to regulate commerce with foreign nations and among the several states" as their authority, senators and representatives proceeded to make transportation amenable to the public will. The Cullom Act of 1887 was the result. But this soon proved more admonitory than corrective. Amendments were grafted on it in 1889, 1891 and 1895. Still complaints grew apace. In 1906, the act was vitalized by the so called Hepburn amendments and regulation that regulated came into existence.

## THE OBJECTS OF THE ACT

Primarily, the act is an instrument to regulate the transportation agencies of the country, but, inasmuch as these agencies exist by the traffic the public tenders them, by implication in every instance, and by direct phraseology in several, the shipper is also subject to the provisions of the law. Thus, where the act strikes down an unjust discrimination of the carrier, preferential to some favored industry, it also strikes at the beneficiary of such discrimination. More than that, in the duties and burdens it places upon the shipper in his relations to the carriers and the public at large, equally, if not more so than in the demand it makes of the carriers, the vitalizing features of the act as it stands today find their fullest expression.

An intelligent understanding of the law must comprehend a full knowledge of its dual requirements. Preliminary to this must be cognizance of what the act controls. By specific description, the term "common carrier" is made to embrace not only the railroad proper, or the rail and water lines when land and water facilities are used

under a common arrangement for continuous carriage, but pipe lines, express and sleeping-car companies.

Every commodity, excepting water and natural or artificial gas carried through pipe lines, comes under its restrictions. "Railroad" is made inclusive of all bridges and ferries used in connection with any railroad, all the road used by any corporation operating a railroad, all switches, spurs, tracks, terminal facilities, depots, yards and grounds used or necessary in the interstate transportation or delivery of persons or property. "Transportation" itself covers cars and other vehicles and all instrumentalities and facilities of shipment or carriage, irrespective of ownership, and all services in connection with the receipt, delivery, elevation and transfer in transit, ventilation, refrigeration, icing, storage and handling of property transported.

Discussion of the commerce act has been all so largely with respect to the duties it lays upon the carrier that a brief recital of what the shipper is entitled to under the law from these agencies of transportation is deemed sufficient here. In the first place, he is entitled to transportation upon reasonable request therefor. The carrier is also bound by law to give him through routes and joint rates applicable thereto. All charges must be just and reasonable.

The classifications of freight and the rules and regulations governing rates, classifications and tariffs, must be able to meet the same test. The shipper has a right to rates that are not only just and reasonable in and of themselves for the services rendered, but transportation charges that shall not discriminate against any particular traffic, persons or communities where the conditions and circumstances are substantially similar and the service is of a like and contemporaneous kind. The foregoing in itself is an inhibition against preferential rates to traffic, persons or localities, but the act also carries the specific prohibition against preferences in rates and practices.

## ALL RATES MUST BE MADE PUBLIC

The Act to Regulate Commerce also makes it unlawful to charge more for a shorter than for a longer haul over the same line or route in the same direction. Where a railroad reduces rates to meet water competition, the elimination of that water competition will not be permitted to furnish justification for again raising the railroads' rates. These provisions were storm centers in the legislation of 1910. Upon application by the carriers, existing adjustments in violation of the long- and short-haul principle must be withheld until such time as the commission might pass upon the commercial justification of such departures.

One of the greatest aids to the shipper and most effective deterrents of discrimination is found in the provision of the law which requires carriers to post all changes in rates at the stations to and from which they apply not less than 30 days in advance of their effective dates. From these tariff charges no deviation is permitted, either directly, or by devices such as false billing, false classification or false weight.

Practices of such devices subject the carrier and its agents to a fine of not more than \$5000, or two years'

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imprisonment, or both; the penalty for rate discrimination is a fine not exceeding \$5000, or imprisonment not exceeding five years, or both. Carriers are forbidden to engage in traffic without tariff authority. The shipper may demand written rate quotations from the carrier and damages arising from a misquotation or failure to quote within a reasonable time carries a penalty of \$250, accruable to the United States.

The shipper is entitled to through routes for his consignments. Where several routes are available under a joint tariff, he is also given the right to direct the routing of his goods, both intermediate and terminal, subject to such reasonable exceptions as the Interstate Commerce Commission may from time to time prescribe. The carrier must also provide reasonable facilities for operating through routes and prescribe reasonable rules and regulations governing the operation of said routes.

It must furnish switch connections with private sidetracks, where such connections are reasonably practicable, can be put in with safety and the volume of traffic warrants the construction and maintenance of such connection. Cars must be distributed among shippers to the best of the carrier's abilities and without discrimination. Provision must likewise be made for the interchange of traffic between carriers and discrimination between connections is forbidden, though one railroad is not compelled to give the use of its tracks and terminal facilities to a competing line. The railroads are not permitted to adopt devices to defeat the continuous carriage of through freight.

#### ACTION FOR RECOVERY

The act also provides that the shipper may look to the initial line for reimbursement for loss or damage to freight; this is the Carmack amendment. With the exception of timber and the manufactured products thereof, and supplies for the carrier's own use, no railroad may transport any commodity in which it has an interest, direct or indirect. Free transportation, as far as the shipper is concerned, is limited to the necessary caretakers of live stock, poultry, fruit and milk. The carrier may not disclose any knowledge of a shipper's business except to governmental authorities, connections or in the course of legal process. A shipper is entitled to reasonable compensation for services or instrumentalities furnished in connection with transportation.

If the carrier is derelict in any of the obligations laid upon it by the act, the law gives the shipper the right to make complaint to the Interstate Commerce Commission, in whom is vested plenary powers to hear such complaint, determine the merits thereof and make appropriate orders in connection therewith. That there should be no defeat of justice through narrow construction, the law confers this right of appeal to the commerce board on "any person, firm, corporation, company or association, or any mercantile, agricultural or manufacturing society, or other organization, or any body politic or municipal organization or any common carrier." The commission is also authorized to entertain complaints forwarded by state railroad commissions. "No complaint," reads the law, "shall at any time be dismissed because of the absence of direct damage to the complainant."

This right of complaint embraces not only rates and practices in effect at the time of filing of the petition, but also changes about to be put into effect. The commission

can, if it deems the equities of the case warrant the action, suspend any proposed advance for a period not exceeding ten months. As to all charges advanced since Jan. 1, 1910, the burden of proof to defend such increase is upon the carrier.

If the violation of the act has resulted in damage to the complainant, the commission has discretionary powers to award the injured party reparation. In any award of reparation, it may be parenthetically remarked, the commission makes a practice of reaching the man who paid the freight. All complaints for the recovery of damages must be filed within two years from the time the cause of action accrues.

#### PRECAUTIONS THAT ASSURE EFFECTIVENESS

Since the underlying purpose of the act is to secure equality of opportunity, it necessarily follows that all favoritism which operates to destroy that equality is unlawful; that it is as reprehensible for the shipper to be the recipient of unlawful gratuities as it is for the carrier to permit preferential adjustments to exist. To obtain the needed reciprocating action of the law, Congress hit upon publicity, coupled with corrective powers, as the instrument of accomplishment. It said: Require every rate, every practice of the common carrier to stand open before the whole world. Publicity of rates and regulations will expose the discriminations against which popular clamor has been directed; we clothe the Interstate Commerce Commission with full powers to take summary action in correcting the evils that show themselves.

But publicity without effective enforcement would only aggravate. To avoid this, the published rate was made supreme and on the shipper is laid the burden of knowing what this published rate is. He must know and he must pay this rate, no more, no less. This is the great responsibility the law puts upon the shipper, knowledge of the published rate and absolute adherence thereto. If a railroad misbills, that does not avoid the shipper's liability to pay the legal rate. Even the practice of offsetting overcharges with undercharges is frowned upon. Each shipment is considered a separate transaction and carriers are required to exhaust their legal remedies in collecting their full tariff rates. Unlimited extension of credit by carrier to shipper has, in at least one instance, been urged as a basis for indictment on the grounds of rebating.

Harsh as this principle may seem in theory, onerous as it sometimes proves in practice, it has been recognized generally as the only way in which the equality sought for in the law might be enforced. One deviation from the published rate would open the door to more. Misquotation of rates subjects the carrier to fines recoverable by the United States, but offers no redress to the injured shipper.

#### SOME UNUSUAL FEATURES OF THE ACT

This in no way contravenes the shipper's right to just, nondiscriminatory rates and charges, for every unreasonable rate or practice is declared unlawful. To properly understand the situation, one must know the distinction between "legal" and "lawful;" the publication of a rate in the manner prescribed by law, runs the substance of a principle announced by the Interstate Commerce Commission in the case of the Arkansas Fuel Co. vs. Chicago, Milwaukee & St. Paul Railway Co., 16 I. C. C. Rep., 95,



makes the rate a legal rate, but the mere publication cannot make a rate lawful that is unreasonable and excessive; no rate can be lawful in the sense of being immune from attack, either with respect to past or future shipments, if it be excessive and unreasonable in amount.

So, if the legal rate be unlawful, the only course open for the shipper is to pay it and then seek relief from the commission. Granted that the rate is unlawful, the commission will then fix a just rate which shall be open to every shipper alike and order reparation—if the claim is well founded therefor—to the injured shipper. And that full justice may be preserved, the principle of reparation will apply to all who have shipped under the rates condemned, when such shipments are not barred by the statute of limitations and when they come within the provisions laid down by the commission in its original rate and reparation decision.

Congress was not content to rest with the general declaration that all rates, charges, practices and regulations should be just, reasonable, nondiscriminatory and non-preferential, but augmented the general prohibition against charges opposed to these principles by singling out special vices for condemnation in the case of the shippers; it has also not stopped with the pronouncement that they must pay the published rate without deviation, but has stamped illegal certain devices that had been used to defeat the spirit of the law. Connivance or collusion of the carrier or its agents offers no mitigation. The attempt to defeat the rates is made equally criminal with the actual accomplishment of the unlawful project; both are declared frauds and misdemeanors and made punishable by a fine not exceeding \$5000 or, in the case of real persons, imprisonment for a term not exceeding two years, or both.

#### LIABILITY OF THE SHIPPERS

But the law goes still further in its check on the unscrupulous. It makes the unfounded claim also a fraud and a misdemeanor, punishable by the same penalties and extending in the same way to shippers and their agents found mulcting the common carrier by this same device. That evasion of the intent of this section of the act may not be easy, the prohibition runs against those who, "by false statement or representation as to cost, value, nature, or extent of injury, or by the use of any false bill, bill of lading, etc., knowing the same to be fictitious or fraudulent, attempt to obtain any allowance for damage in connection with the transportation of property, whether with the connivance of the carrier, whereby the compensation of such carrier is made less than the regular rates.

When a preferential adjustment is made, railroad officials not infrequently set up the defense that the rate or practice complained of was not the voluntary act of the carrier, but was forced upon it by the pressure of large shipping interests controlling tonnage of such volume that the transportation company was loathe to see it go to other lines. In its attempts to safeguard equality of opportunity, Congress has taken cognizance of this condition; it has declared that any shipper or his agent who, "by payment of money, attempts to induce any common carrier or its officers or agents, to discriminate unjustly in his favor, as against any other consignor or consignee," shall be guilty of a misdemeanor and liable to a fine of \$5000, or two years' imprisonment, or both, for

each offense. In addition, such shipper or its agents, shall, together with the common carrier, be liable jointly or severally for all damages arising from such discrimination.

As the carrier is estopped from disclosing information relative to a shipper's business to his competitor, so, too, the shipper soliciting such information as may be detrimental or prejudicial to his rival subjects himself to a fine of \$1000.

#### CONCLUSION

The effectiveness of any law is wholly dependent upon the public support that lies back of it. The Act to Regulate Commerce as it now stands is one of the most concrete expressions of the broader social sense of justice that has grown up in this country within the last few years. It is an index to an awakened business conscience, a reaffirmation of the age-old principle that you cannot build lasting success on the advantages you may unjustly take of your neighbor. Many of the practices now condemned in this statute were frankly recognized a decade ago as shrewd business and proof of commercial acumen. It is more than possible, in the light of past experiences, that certain of the practices that today bear the stamp of legitimacy, tomorrow may be crossed with the bar sinister. But, whatever the changing ideas of business morals may bring as to specific performances, it is inconceivable that there should be any departure from the fundamental purposes of equality of opportunity as expressed in this act. The instruments of guarantee for this equality, full publicity and strict adherence to the published rates, have proven adequate to the needs of the times. The soulless corporation is still run by living men who will still err as in Pope's day, who still will look at things from different angles; the mistakes of the past have not all been wiped out; the sins of the railroads and industrial fathers not all canceled by their children and new wrongs are bound to intrude from time to time in the relations between the transportation industry and commerce at large. But the machinery of redress is there.

To the shipper who knows his rights, such wrongs can only be temporary and prompt action will save him from permanent financial scars. His right to redress and relief, however, is still predicated upon that doctrine of universal application, that he must come into court with clean hands. Translated into direct terms of transportation this means that he must know his rates; he must pay them; he must adopt no device, however legal it may be, that will defeat the published rate; that will enable him to obtain his services at less than this rate. Having thus established his title to justice, he can stand at the bar and demand it.

■

### Coal Rates to Chicago

The Peabody Coal Co.'s monthly, "Coal Trade Sparks," describes Indiana and Illinois freight rates to Chicago as follows:

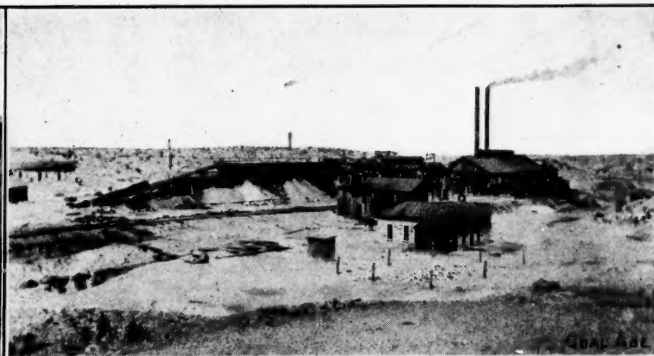
	Number of Billing Points	Freight Rate per Ton
<b>Indiana</b>		
Clinton and Brazil.....	29	\$0.77
Linton.....	75	0.87
Princeton.....	15	0.94
Booneville.....	11	0.97
Evansville.....	1	1.27
<b>Illinois</b>		
Montgomery County.....	6	0.82
Central Ill. (Springfield).....	63	0.82
Du Quoin.....	11	0.97
Belleville.....	72	0.97
Southern Ill.....	48	1.05



## Snap Shots In Coal Mining



THE PENWELL COAL COMPANY'S TIPPLE AND SURFACE PLANT AT PANA, ILL.



TIPPLE AND BOILER HOUSE AT GOVERNMENT MINE OF CARTHAGE FUEL CO., CARTHAGE, N. M.



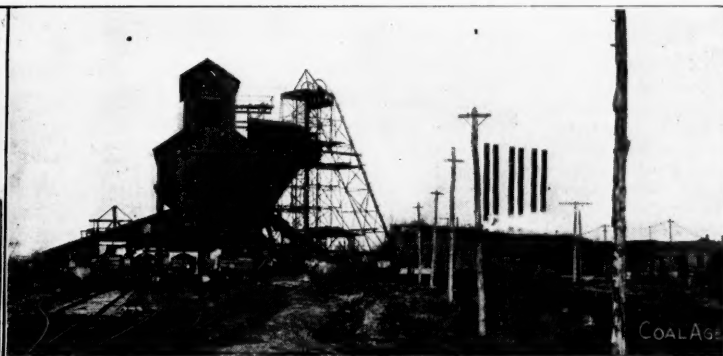
TIPPLE, POWER HOUSE AND STORE OF H. C. FRICK COKE CO., AT GATES, PENN.



WASHER AT VIRGINIA MINE OF CONSOLIDATED CONNELLSVILLE COKE CO., GRAY'S LANDING, PENN.



OLD-FASHIONED WOODEN TIPPLE OF NEBO CONSOLIDATED COAL & COKE CO., CIRCLE CITY, KY.



ONE OF THE MODERN PLANTS OF THE CHRISTOPHER COAL MINING CO., IN SOUTHERN ILLINOIS

COAL AGE OFFERS A PRIZE OF \$3 EACH WEEK FOR THE BEST PHOTOGRAPH SENT TO US BY ANY SUBSCRIBER. PRINTS SUBMITTED MUST BE FOR THE EXCLUSIVE USE OF COAL AGE. ALL PHOTOGRAPHS NOT AWARDED THE FIRST PRIZE, BUT ACCEPTED FOR PUBLICATION, WILL BE PAID FOR AT A LIBERAL RATE, NEVER LESS THAN \$1 PER PHOTO.

## Wage Negotiations in Central Penn.

*The following letters were submitted to the miners' scale committee by the Bituminous Operators of Central Pennsylvania. They refuse to consider the check-off, and request a reduction of 10 per cent. in wages.*

### LETTER No. 1

Du Bois, Penn., Mar. 3, 1914.

TO THE SCALE COMMITTEE OF THE UNITED MINE WORKERS OF AMERICA OF DISTRICT NUMBER TWO:

WHEREAS, under the terms and conditions of the various scale agreements entered into for many years between the Operators and United Mine Workers of America, the operators have been compelled to collect from their organization employees, in one form or another, the dues and assessments levied by the United Mine Workers of America, which system of collection is commonly called the "Check-off"; and

WHEREAS, During the past few years at various intervals extra assessments were laid or levied by the United Mine Workers of America on its members for the purpose of maintaining strikes at other points or in other states, with the demand on the operator to collect the same, which caused more or less dissension and controversy, strikes and suspensions in our own region; and

WHEREAS, legal action has been taken in some of the states against the United Mine Workers of America for such action, alleging a conspiracy between operators dealing with organized labor and the United Mine Workers of America; and further actions have also been threatened as disclosed by newspaper reports; and

WHEREAS, the check-off system has become so serious, unreasonable and un-American from the abuse or misuse on part of the United Mine Workers of America as to make its abolition necessary.

THEREFORE, BE IT RESOLVED, That the Association of Bituminous Coal Operators of Central Pennsylvania, through its Scale Committee this day assembled, do hereby demand from the United Mine Workers of America of District Number Two, an elimination of all such check-off provisions or clauses from all future scale agreements, and that hereafter the operators shall not be required in any manner to collect in any form from its organized employees any dues or assessments that may be levied or laid on said employees by the United Mine Workers of America.

### LETTER No. 2

Du Bois, Penn., Mar. 3, 1914.

TO THE SCALE COMMITTEE OF THE UNITED MINE WORKERS OF AMERICA OF DISTRICT NUMBER TWO:

WHEREAS, the coal operators of central Pennsylvania, doing business within your district and with organized labor, have granted the miners of said district, from time to time during the past fifteen years, increases in wage rates amounting to 50%, which has resulted in the highest wage that has ever been paid to the miners in the history of this district; and

WHEREAS, during said period of fifteen years, the cost of producing coal, outside of the question of wages, has more or less likewise increased, produced by increased cost of material and new mining and other laws, both state and national; and

WHEREAS, the competition from the nonunion or unorganized coal fields, which work on a lower wage basis, is just as keen and severe as it ever was with the operators of the Central District of Pennsylvania; and

WHEREAS, during said period of fifteen years, the average selling price of bituminous coal in the markets, eliminating one or two temporary flurries, has rather decreased than increased, and the operators are further prohibited by the Sherman law from forming any combination to regulate the selling price of coal; and

WHEREAS, a contract was made and entered into on Apr. 20, 1912, between said operators and miners whereby a 5% increase in wages was granted to the miners who therein guaranteed that the operators should have the right to work their mines on the open-shop basis, and, notwithstanding such contract, the miners at numerous mines throughout the district refused to work with nonunion men, demanded an absolutely closed shop which resulted in a large number of strikes likewise in violation of said contract and thereby

materially interfered with the business of said operators in not only a loss of trade, but also in the increase of expenses; and

WHEREAS, since about Oct. 1, 1913, a decided slump has taken place in the general business of the country and especially in the coal business to such an extent as to enable the large consumers who make their annual contracts for a coal supply based on normal business to accumulate large surpluses or stock piles of coal, thereby resulting in a general stagnation of the coal business to such an extent as to make coal a drug on the market, large accumulations of unsold coal at the mines and only about half time for the miners; and further that the coal business is showing a steady decline, and that the large amounts of surplus coal in the hands of the consumer do not argue for an upward turn in the near future; and

WHEREAS, the burden of depression of business conditions must be recognized and born mutually by the miners and operators of this district.

THEREFORE, BE IT RESOLVED, That the Association of Bituminous Coal Operators of Central Pennsylvania, through its Scale Committee this day assembled, do hereby demand from the United Mine Workers of America of District Number Two, a general deduction of 10 per cent. from the wages paid under the scale agreement of Apr. 20, 1912.

✱

## The Slack-Coal Problem in Colorado

BY CARSON W. SMITH\*

There is beginning to be a slack problem in the northern Colorado lignite field, which is becoming more serious each season. The market for this grade of coal is becoming steadily more restricted and actual losses are sustained in handling it during at least one or two months of the year. From an economic standpoint, it is essential that the slack be sold at such a figure that it will carry its proper proportion of the operating costs.

The standard grade of slack in this district is that passing through a 2½-in. screen, the portion passing over the screen being sold as lump coal. While this slack makes an excellent steam fuel, the demand from this source has been steadily decreasing for some time. This is probably due principally to the incursion of electric power into its market, some of the mines themselves having adopted this. In fact, the principal demand for slack coal now comes from sources where the requirements extend over a portion of the year only, such as the beet-sugar factories, heating plants in the cities, canning factories, etc.; the fluctuating character of this business naturally results in unstable market conditions. Thus a market in which substantial premiums prevail may be abruptly changed, due to a sudden heavy demand for lump coal, which naturally results in an excessive production of screenings, with the result that the situation is rapidly reversed.

Normally, the margin of profit on this grade is small, while car shortage, inadequate methods of storage and deterioration are all factors tending to complicate the problem. Occasionally, the slack is dumped on the ground alongside the track at costs, including shrinkage, waste, etc., ranging from 25 to 50c. per ton, although this might be accomplished at a cost of about 10c. per ton. While a more comprehensive plan for doing this on a large scale would do much to establish a more equitable market, this would involve some uncertainty, as, for instance, the danger from spontaneous combustion (lignite coal firing easily), while elaborate and extensive equipment would be required. There is also the ever-present tendency to take a gambler's chance on the possibility of real-

\*Consolidated Coal & Coke Co., Dacona, Colo.

izing a higher figure for the slack coal each succeeding season.

#### MORE CAREFUL SIZING

It has also been suggested that a broader market for the slack coal might be obtained by a more careful sizing, say, for instance, rescreening into nut and pea coal. This has never been done heretofore, and, in fact, there are grave physical reasons for doubting the practicability of such a scheme; for instance, it is doubtful whether the breakage and disintegration incidental to loading, shipping and delivering would not cause this lignite coal to deteriorate until it was practically worthless.

This would certainly be the case if the coal is handled over the ordinary shaking screen and loaded in open railroad cars; but if it were put through suitable revolving screens and carefully deposited in the cars by means of loading booms and, say with the nut coal in closed cars, it is probable that a satisfactory product could be shipped in cold weather in any event. It is quite possible that some such plan will be tried in the near future, in which event the nut coal will be sold as a domestic grade and the pea coal as a superior steam fuel, the remainder of the screenings being thrown away. This seems to be a logical solution for the problem, providing a satisfactory market can be developed for the nut and pea coal, and it should result in a reasonable profit.

There is also the possibility of briquetting the slack coal, and it is not improbable that this may develop into an important industry in the near future. This would, of course, result in the slack coal being utilized in the domestic trade, for which purpose it is now entirely unsatisfactory. One of the most important advantages of such a condition would be that the necessity for having a market for steam coal would be eliminated, and the electric power would have this latter field to itself. Such a readjustment in fundamental conditions as this would, of course, involve enormous expenditures for additional equipment, and it is unlikely that such will be attempted for the time being.

#### UNDERGROUND STORAGE

The third solution of the difficulty is the storage of the slack coal underground. It is claimed that this is entirely practicable, and that large tonnages could be conveniently accumulated in many of the lignite mines and at little cost. It will not deteriorate so rapidly when stored underground, nor will the waste or shrinkage be so great, but there will be the danger of spontaneous combustion.

This plan provides for loading the coal at the working face with "harps" or screening forks, throwing the finer sizes back against the rib. Of course, a readjustment in the basis of payment would have to be made in order to reimburse the miner for shooting the unloaded portion, and the cost of reloading this when required would also have to be reckoned in. Suitable rooms in the mine would have to be selected, preferably new ones, having relatively little refuse and gobbled so that the slack could be thrown back and left for several months, if necessary. The number of places to be worked thus could be gaged according to the demand for slack coal at the time; and it would seem that there is no theoretical reason why such a method should not operate successfully.

It is naturally to be expected that an innovation of this character will develop problems in working out the

details in practice, but it is difficult to foresee any of a serious character; and it is quite probable that if many of the operators would investigate the marketing of their slack coal, they would find an explanation for their reduced profits.

#### Reversing Fans at Collieries

A large underground fire broke out at one of the best equipped mines in Pennsylvania in 1909, and William Clifford was requested to help. When the colliery was reached (one hour after the summons), the smoke issuing from the upcast (winding) shaft was so dense that the order was given to extinguish all lights burning around the fringe of smoke, and all smokers were told to stand away. By holding his breath and deliberately walking into the smoke up to the edge of the shaft, Mr. Clifford says, in a paper read before the Manchester Geological & Mining Society, he was able to observe a very sensible brightening of the flame on his safety lamp.

The fan was of the blowing reversible type, so that the preparations for changing it to an exhaust occupied a period long enough to allow of the situation being taken in. It was found that the returns contained carbon monoxide in such quantities as to make it imprudent to pass the air back upon the fire and that all roads in which it was necessary to work were foul; also that there was some danger of driving the firedamp, through openings made by the fire, directly upon it. The fan was therefore not reversed.

In other cases of collieries giving off firedamp freely, and having reversible fans primarily run as blowers at high water gages (some producing 5 in.), Mr. Clifford stated that immediate reversal would make a difference of 10 in. in the water-gage (that is, from 5 in. propulsion to 5 in. exhaustion—the equivalent to a fall of the barometer of nearly 0.36 in.). The operation is dangerous and must be performed cautiously, if at all, especially with a fire underground. This refers more particularly to mines where there may be considerable firedamp in the gob. In such cases the reversed volume should be the smallest required.

#### BY THE WAY

The shortest answer is to do it.

It is often better to bend than to break.

Don't think a royal crown will cure a headache.

Water down in the well does not quench thirst.

The water runs smooth where the river is deep.

Little troubles speak loudest; great cares are dumb.

It's not so hard to catch the mouse that has but one hole.

We can't gather roses without being pricked by the thorns.

Many men go wool-gathering and come home shorn themselves.

The fellow who wears the shoe knows best where it pinches.



# Cleaning Anthracite by the Huff Electrostatic Process

By H. P. WITHINGTON\*

**SYNOPSIS**—An adoption of ore-treating methods for the cleaning of anthracite coal. An experimental apparatus, on a small scale, has given satisfactory results. A high efficiency is obtained while operating and maintenance costs are moderate. Future developments along this line will be watched with interest.

The Huff Electrostatic Process, a method for mechanically concentrating or separating materials, has been used extensively during the past few years by some of the largest metal-mining companies in the country in the successful treatment of ores, but not until comparatively recently, has consideration of it been given to the cleaning of bituminous coal (for coking or briquetting) and the reduction of ash in anthracite Nos. 1, 2, 3, buckwheat, rice, barley and culm.

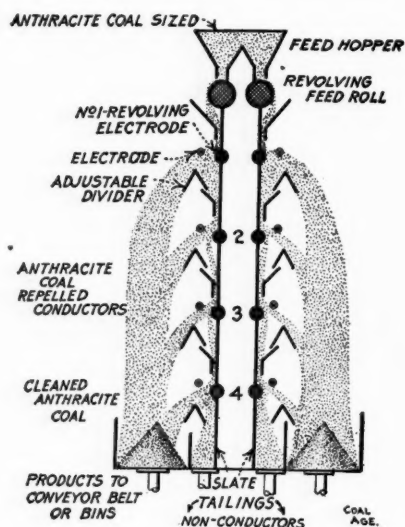


FIG. 1. SKETCH SHOWING PRINCIPLE OF THE APPARATUS

The process in its application to coals consists in effecting separations of such impurities as slate, bone, sulphur, iron phosphorus, etc., by utilizing the difference in electrical conductivity of these ingredients; it is accomplished without water and regardless of specific gravity or magnetic quality. Fig. 1 illustrates the principle of the process as applied in a field machine. The coal is fed to a hopper with an adjustable gate, which allows an even feed of a stream one or two particles deep to the first roll or "electrode" directly below.

The revolving electrode consists of ordinary steel shafting, 1½ in. in diameter, opposing which is a non-rotating electrode; means are provided for regulating the distance between these electrodes. As the mass of coal, slate, bone, etc., passes through the electrical field between the electrodes, the conductive particles are repelled or thrown out over an adjustable divider while the nonconductive remain inert and drop down to another electrode, where they are subjected to similar treatment. This repetition

is necessary as the particles get in the way of one another and it is impossible to make a complete separation on one electrode. For most coals it should not take more than four electrodes, as shown, to make the two final products—clean coal and tailings.

It is possible to treat the very fine sizes such as "slush," "silt" and "dirt" (local names for culm) on a machine composed of slides or chutes, but with this apparatus, the only moving part would be the feed roll.

## DESCRIPTION OF THE APPARATUS

A machine having the revolving electrodes 30 ft. long and built double (3 ft. 6 in. wide), as shown in Fig. 1,

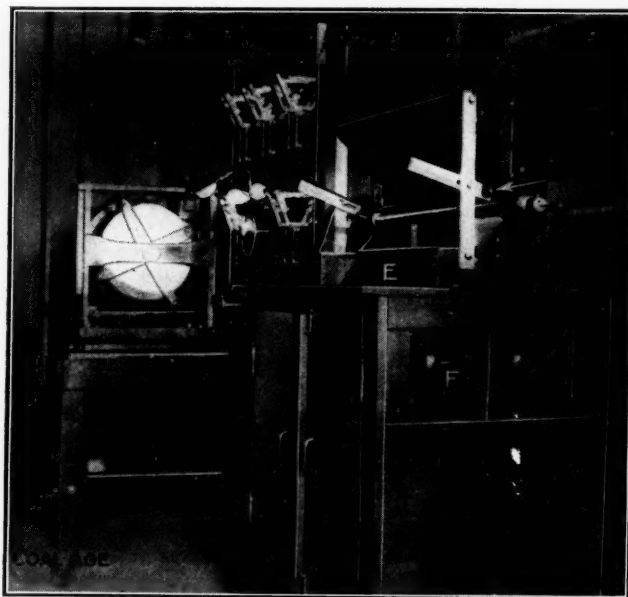


FIG. 2. EXPERIMENTAL APPARATUS NOW INSTALLED

does not require more than two horsepower, electrically and mechanically, to operate. The capacity of the machines varies, for the same reason as does that of any jig or other concentrating apparatus, with the size of material treated. In cleaning No. 3 buckwheat, one machine should handle 150 tons in twenty-four hours.

The electrical set, for producing the electrostatic fields, consists of special generators and transformers, but of standard construction and capable of steady commercial use. In separating ore they are in use twenty-four hours per day and seven days a week. A three-horsepower motor drives the set. Fig. 2 shows the switchboard, and to the left a generating set capable of supplying a plant of 500 tons capacity. This outfit, which takes up little space, is capable of generating 35,000 volts, but at low amperage, thus eliminating danger in the operations. To the right of the switchboard is shown a one-electrode coal-testing machine, driven by a one-quarter horsepower motor (inclosed). A is a feed hopper of 50 to 75 lb. capacity. B is an adjustable feed gate which can be raised or lowered according to the size of material and the

\*Harris Laboratory, 86 Fulton St., New York.

thickness of feed desired. *C* is the revolving electrode of the same diameter as used in a field machine. *D* is the opposing adjustable electrode, also of the same diameter as used in a field machine. The distance between the electrodes is varied according to the size of the material being separated.

For separating coarse particles the electrical field should be strong in order to repel and attract the conductive material over the divider *E*, to accomplish which, the opposing electrode is brought in close proximity to the revolving one. *F* is a drawer containing the conductive clean coal product which has been repelled over the divider *E*, while *G* is a similar drawer containing the nonconductive elements, slate with more or less bone. Divider *E*, being adjustable, may be set to obtain any grade of product desired, or, in other words, a high or low recovery. A low recovery of very clean material may be had, or a much higher recovery with corresponding decrease in grade may be obtained by the adjustment of this divider.

#### METHOD OF OPERATING

With this electrical apparatus, which is the counter part of that in use in a number of large plants, and con-

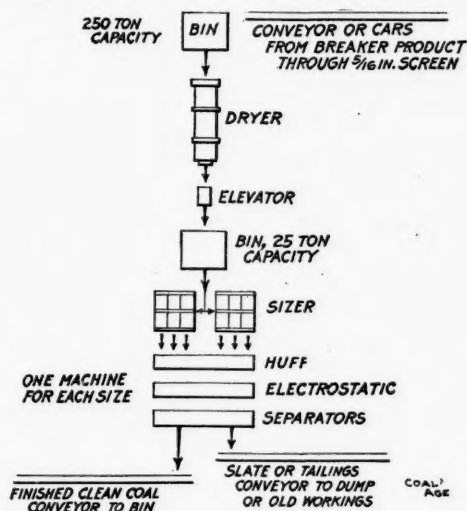


FIG. 3. FLOW SHEET FOR A 500-TON PLANT

ditions the same as in the operation of a 500-ton commercial plant, the feed and electrodes of the same diameter as those in the field machines, accurate tests can be made on a small sample of 150 lb., the results of which can be relied upon to be duplicated in field or commercial work.

The one-electrode testing machine makes it possible to sample the products each time they are treated or separated, and also if found necessary, to have an analysis made before rerunning the clean coal product. By adjusting the chutes in a field machine almost any grade of coal can be treated, as the process is simple and flexible, and requires no special attention.

Due to its compactness, an electrostatic plant can be built adjacent to a breaker and by means of a conveyor belt or cars all the product mined and passing through a 3/8-in. or 1/4-in. screen can be treated. Fig. 3 shows a flow sheet of a proposed 500-ton plant. Coal comes from the breaker after passing through a 3/8-in. or 1/4-in. screen, is dried, and separated in the electrostatic machine. Practically all the moisture must be eliminated, as water is a good conductor of electricity, and makes

the slate and other impurities conductors. This leaves a dry material of maximum heat units.

Anthracite coal running from 15 to 25 per cent. ash (slate) can be successfully cleaned electrostatically, as this slate has much less electrical conductivity than the coal (carbon) which latter has excellent conductive properties. The coal can be dried on this scale for less than 13¢ per ton, an insignificant amount in comparison to the enhanced value of the dry finished product. This cost of drying includes labor, power, fuel and depreciation.

From the rotary dryer, the coal passes to a sizer from which three or four sizes can be obtained from the same machine, or more if necessary. The greater the number of sizes made, the corresponding lessening of the capacity. As the sizers can be placed on the top floor of the plant, the products are piped to the electrostatic machines on the floor below. The same is true of the electrostatic process as of any other concentration or separating process; i.e., the closer the sizing, the better the separation. After passing through the machines and the two final products are made—finished coal and refuse—conveyors take the cleaned coal product to storage bins while the slate can be flushed back into the old workings.

#### SOME ADVANTAGES OF THE ELECTROSTATIC PROCESS

By the electrostatic process not only can practically all the coal be saved, including that which passes through a 3/2-in. screen, but the ash content is so reduced that the product can be sold on an absolutely guaranteed ash-and-moisture basis, the ideal method of purchasing. This kind of coal naturally commands a higher price since it is a much superior product. The ash-disposal charge is greatly diminished, the freight lessened, and the B.t.u. value per ton increased sufficient to effect a reduction of from 10 to 20 per cent. in the coal consumption.

The large consumers in New York City using Nos. 2 and 3 buckwheat, rice and barley, buy from 7 to 10 per cent. moisture and from 15 to 20 per cent. ash in their coal. Electrostatic separation should deliver this material with the moisture content practically eliminated, and the ash reduced to 10 per cent. or less.

No doubt a method will eventually be devised to burn direct (instead of briquetting) the clean coal from culm, which in general amounts to about one-half of the total product passing through a 3/2-in. screen and, after electrostatic separation, runs less than 11 per cent. ash. A reason anthracite briquettes have not found a ready market is that they contain from 18 to 25 per cent. ash, which as the briquettes disintegrates chokes the fire much more than when burning stove or chestnut size. With the ash content reduced from 25 or 30 per cent. to 10 or 12 per cent., not only a better grade briquette can be produced but one having a much higher heat value will be obtained.

Thus this electrostatic method, which is just beginning to attract attention in the coal world, should prove of great value to those having to deal with the finer sizes of anthracite. Its application to the bituminous fields will be described later.

To anyone interested in seeing the apparatus shown in Fig. 2 in operation, invitation is extended to call at the Huff Electrostatic Separator Co.'s office and laboratory, 60 India St., Boston, Mass. The same method in a large-scale use may be seen in the metalliferous mining regions.

## Miners Uphold Linker Docking Law in Pennsylvania

A legal battle to determine the status of the Linker Docking law was started by the United Mine Workers when the organization caused the arrest of Superintendent Walter Fahringer of the South Side Division of the Lehigh & Wilkes-Barre Coal Co., charged with its violation. Superintendent Fahringer waived a hearing before Squire McShea, at McAdoo, Penn., and entered bail for his appearance at court.

For many years the coal companies have docked for dirt and rock when the cars reached the breaker. The Linker act, which is said to be generally ignored in the anthracite field, provides that the miner must be paid for his coal when it is mined at the face. If docking is to be done, there is where the charge must be made.

The State Senate amended the act so that it was not to operate in violation of any existing wage agreements between miners and operators. The latter have claimed that it does this, and hence they have not followed it.

Miners cite the charge that the Lehigh Valley Coal Co. docked its Yorktown miners at the Yorktown breaker until the structure was abandoned. Now the dockage is done at Jeanesville, which prepares the Yorktown coal. The men argue that if the company can change the place of payment to the miners, then the state legislature has the same power.

The Linker bill opens other avenues of dispute over dockage. If a miner is digging out coal, he is to be paid by the car. The United Mine Workers argue that if he strikes slate or rock and must cut it out he is compensated by the yardage on another agreement. Since this is the case, the miner is entitled to either pay for cutting rock or pay for mining coal.

The Linker act is designed to prevent thefts of cars of coal. One man of the Lehigh & Wilkes-Barre Coal Co. mines has shown the United Mine Workers' officials that he has lost eight cars at \$2.22 each in two weeks. The contention of the organization that when a miner fills his car and the drivers, servants of the company, take it, it constitutes an acceptance of the car, has never been sustained. But the United Mine Workers assert that under the Linker Docking law, the car is receipted for as it arrives at the face of the breast, and theft of coal cars will be impossible.

## A Record Output at a Pennsylvania Mine

Eighteen 100,000-lb. capacity steel railroad cars loaded in a single day, is the record output recently made by one motorman at Mine No. 1, of the Scalp Level Coal Mining Co., whose offices are at Windber, Penn.

On this particular day they worked exactly nine hours and 45 min. The only haulage equipment used was an 8-ton Baldwin-Westinghouse bar-steel electric mine locomotive, equipped with commutating-pole motors. This locomotive, except for a few mine cars hauled from a dip heading by a mule, did all the work, gathering the coal cars and hauling them to the tippie. When they stopped work in the evening the locomotive was inspected and found to be in first-class condition in spite of the heavy work it performed. The motors were nearly as cool as when they started in the morning.

Twelve mine cars, each loaded with two tons of coal, were hauled on each trip. The longest haul was about 2500 ft., from the face of the first-left entry to the tippie, and about the same distance from face of main heading to tippie. The grades in this mine at two points for a distance of 400 ft. are  $1\frac{1}{2}$  per cent. against the loads.

Thirty-six trips were hauled, and it is estimated that at least two minutes were lost on each trip on account of the motorman waiting for empty cars outside. Notwithstanding this loss of time the operators feel certain this was the highest run of coal ever made in western Pennsylvania in one day by one motorman.

The men at this mine claim that there was no extra ef-

fort made this day to make a record. It was only an ordinary day's work, and they believe that if they would make an extra effort, with every man on the jump, for any one day, this Baldwin-Westinghouse mine locomotive could gather and haul sufficient coal to at least load 24 steel cars.

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## Coming Society Meetings

### AMERICAN MINING CONGRESS

A special meeting of the American Mining Congress, in accordance with a resolution adopted at the 16th annual session of the American Mining Congress, is called, to be held at 8 p.m., Mar. 26, Majestic Building, Denver, Colo. The purpose of the meeting is to adopt or reject an amendment to the by-laws, which proposed change, prepared by H. M. Chance, Eli T. Conner and J. Blair Kennerly, is designed to meet the recommendation of the Ways and Means Committee that some way be provided to furnish a larger fund, so that the work of the congress can be more properly carried on. The proposed amendment will accomplish this end through securing the support financially of the larger mining corporations by making such corporations "subscribing members" of the congress. These "subscribing memberships," however, will not be entitled to vote.

### AMERICAN PEAT SOCIETY

The American Peat Society will hold its eighth annual meeting at Duluth, Minn., Aug. 20, 21 and 22. Papers will be read and discussed on all uses of peat, agricultural, fuel, industrial, etc. Julius Bordolillo, Sec.-Treas., 17 Battery Place, New York, N. Y.

### CANADIAN MINING INSTITUTE

A meeting of the Rocky Mountain Branch of the Canadian Mining Institute is to be held at Fernie, Crowsnest Pass, British Columbia, Mar. 18 and 19. W. R. Wilson, general manager for the Crow's Nest Pass Coal Co., Ltd., is chairman, and John L. Stirling, provincial inspector of mines for Alberta, secretary.

The meeting will be opened on Wednesday, Mar. 18, when the chairman will deliver an address, following which several papers will be read and discussed, as follows: "Mine-Rescue Apparatus," by Charles Graham superintendent for the Corbin Coal & Coke Co., Corbin, B. C.; "Mechanical Equipment of Collieries," by N. C. Pitcher, Lethbridge, Alta.; "Certain Classes of Faults Encountered in the Crowsnest Pass District, with their Correlative Effects on Economic Mining," by W. R. Wilson; "Shaft Sinking in Edmonton Coal Field," by E. I. Roberts, Evansburgh, Alta.

Papers read at earlier meetings of the branch, namely those of J. Somerville Quigley, manager for the Hillcrest Coal & Coke Co., Hillcrest, Alta., on "Methods of Driving Pillars in Pitching Seams"; C. C. Richards, of Edmonton, Alta., on "Field Notes for an Underground Survey"; M. L. Hyde on "Important Details in Connection with Construction of Colliery Plants"; N. C. Pitcher, on "Preliminary Costs of Machinery for Colliery Work"; and of Francis Aspinwall, district inspector of mines, Lethbridge, Alta., and Andrew A. Millar, manager for the Pacific Pass Coal Fields, Ltd., Fergie, Alta., on "Mine-Rescue Apparatus and the Value of Mine-Rescue Work," will also be open for discussion.



## Editorials

### Pertinent Supreme Court Decision

The Supreme Court of the United States has recently handed down a verdict affirming the judgment of the lower court rendered by the late Judge Ferris, in what has become known as the Barrier-Pillar Case.

The anthracite-mining law, Art. 3, Sec. 10, requires the leaving of a sufficient barrier pillar between adjoining coal properties, sufficient to provide for the safety of the employees in those mines. It is stated that the mine inspector of the district, David T. Davis, Aug. 3, 1909, notified the Plymouth Coal Co. and the Lehigh & Wilkes-Barre Coal Co., operating adjoining mines in Plymouth, that the barrier pillar required by law must be left in their respective adjoining workings. By law, Mr. Davis, together with the engineers of the two companies, constituted the board to determine the size of pillar that should be left to comply with the statute. They failed to arrive at any agreement; and, as a result, Mr. Davis, in the following October, filed a bill in equity, in the court of Luzerne County.

This case, which, at the present time, has an important bearing on other mining decisions, was heard by Judge George S. Ferris, now deceased. On the claim of Mine Inspector Davis that a 70-ft. barrier pillar should be left between the workings of these companies, Judge Ferris so ordered. An appeal from this decision was taken by the Plymouth Coal Co., and the case went to the Supreme Court of Pennsylvania.

It was claimed by appellant that the requirement of the anthracite law in question was not in harmony with but contrary to the provisions of the fourteenth amendment to the Constitution of the United States and Art. 1, Sec. 10, of the Constitution of Pennsylvania. These laws are as follows:

Anthracite mining law, approved by Governor Robert E. Pattison, June 2, 1891, Art. 3, Sec. 10:

It shall be obligatory on the owners of adjoining coal properties to leave, or cause to be left, a pillar of coal in each seam or vein of coal worked by them, along the line of adjoining property, of such width, that taken in connection with the pillar to be left by the adjoining property owner, will be a sufficient barrier for the safety of the employees of either mine in case the other should be abandoned and allowed to fill with water; such width of pillar to be determined by the engineers of the adjoining property owners, together with the inspector of the district in which the mine is situated, and the surveys of the face of the workings along such pillar shall be made in duplicate and must practically agree. A copy of such duplicate surveys, certified to, must be filed with the owners of the adjoining properties and with the inspector of the district in which the mine or property is situated.

Fourteenth amendment, Federal Constitution:

No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any state deprive any person of life, liberty or property without due process of law.

Constitution of Pennsylvania, Art. 1, Sec. 10:

No person shall, for the same offense, be twice put in jeopardy of life or limb; nor shall private property be taken or applied to public use without authority of law and without just compensation being first made or secured.

The pertinent bearing, in this case, on present-day mining operations in the anthracite field, relates to the contention of the company that under the provision of the Anthracite law the private property of the coal company was appropriated to public use, namely, the protection of the lives and properties of the community and no compensation was provided for the owner of the coal left for this purpose. It was claimed that this was an illegal exercise of the police powers of the state.

Judge Ferris, in rendering his decision, from which the appeal was taken, discussed broadly this contention of the appellant company, stating in words that are memorable:

*The principle is equally vital, because it is essential to the peace and safety of society that all property in this country is held under the implied obligation that the owner's use of it shall not be injurious to the community; therefore, the act of 1891, under which this case was brought, was a valid exercise of the police powers of the state.*

Without going further into the details and merits of the barrier pillar case, we would draw attention to the application of the principle involved in that case, as recently made by City Solicitor David J. Davis, who is resisting, at present, the appeal taken by officials of two of the largest coal companies in the anthracite region. The city solicitor claims with much justice, we believe, that the principle of equity laid down by Judge Ferris, in the former case, applies with equal force to the protection of the lives and properties of communities residing on the surface overlying coal seams from which the mineral is being extracted.

It is a large question and one to which COAL AGE has referred previously as involving "a clash of equities." The law defining the equal rights of surface holders and the possessors of underlying mineral claims has yet to be clearly defined. It cannot be decided briefly or offhand, but must be worked out with due regard to justice and the equal rights of the parties concerned.

The principle, however, of the *paramount importance and value of human life and health, in its relation to individual or corporate rights*, is unquestionable. Any law that ignores this principle is unstable and must eventually be annulled.

### A Lean Winter for the Coal Companies

Following a summer period of almost unprecedented activity, the coal trade has experienced a winter season of equal depression. The trouble seems to have been due to a combination of adverse conditions, such as the general wave of retrenchment in all lines of industrial activity, and to the peculiarly mild temperature prevailing throughout the country during most of the season. Under the compelling influence of these determining factors, the coal trade has rounded out the year in a most disappointing form.

It is likely that even the most consistent pessimists have failed to realize the full proportion of the curtail-

ment, upon which a study of the performance of some of the leading coal roads offers some interesting thoughts. The Pennsylvania Railroad, the largest bituminous-coal road in the country, showed a substantial increase in fuel shipments all through the year 1913 until the break occurred in December. Until that time the total shipments over this road for 1913 amounted to nearly 70 million tons, as compared with 63½ million in 1912. But December shipments for 1913 were 300,000 tons less than in 1912, while in January the movement for the current year was 600,000 tons less than the same month last year. A sudden decline in the shipments is noticeable, beginning with October; in that month 7 million tons were handled, 6½ million in November, 6¼ million in December, and less than 6 million in January. The other bituminous coal roads reflect substantially the same conditions.

Because of the shortage of some six million tons as a result of the six weeks' suspension in mining in the early part of 1912, a comparison of the monthly shipments of anthracite cannot be made fairly with the movement in 1913. However, it is a significant fact that the total shipments for the year 1913 fell short of those for the last previous normal year, 1911, by nearly a million tons. The meager shipments of 4½ million tons in January of this year, the lowest made during any normal month since September, 1909, speak eloquently of the adverse conditions in hard coal. Turning to the earnings of the Reading company, we find still additional light on this subject. January receipts for the current year were \$2,836,047, as compared with \$3,680,572 for January last year, while profits for the same periods were \$95,359, and \$560,356, respectively.

A glance over the coal-car supply statistics substantiates still further these conclusions. When the peak of the load was reached in mid-October, a net shortage developed which continued until Nov. 1. But during the closing two months of the year, the surplus of coal equipment was more than doubled each two weeks, finally reaching over 86 thousand on Jan. 15—a figure scarcely exceeded during the suspension in both the anthracite and bituminous fields in April, 1912.

But even in the face of these adverse conditions, there are hopeful possibilities in the future. It is noted, for instance, that free tonnages of demurrage coal are not being indiscriminately dumped into a market totally devoid of any absorbing power, in the manner characteristic of previous dull seasons. There are also many who rightly argue that the possibility of a suspension in the bituminous field Apr. 1, will have an important psychological effect upon the trade. Whether this materializes is dependent entirely upon the pending negotiations.

Opinions as to the outlook in this regard are about as inconsistent as in former years. The possibility of a suspension of more or less long duration seems to be about equally balanced, although the opinion of those best informed on the subject seems to be that a shut-down of at least short duration is inevitable.

### The British Fatality Rate

The British fatality returns are always based on two different methods of computation. One is concerned with separate fatal accidents and the other with the number of

lives destroyed by such untoward occurrences. While tables like the latter may be unduly swelled by one or two severe explosions, hoisting accidents, inundations, air-blasts or mine caves; the former must always remain in some ways a fairer index of mining conditions.

As an example of the dependence of the total fatality rate on the casting of a die, the Bicknell explosion in the state of Indiana at the close of last year is a case in point. It evidenced that the mine was in a dangerous condition just as clearly as if it had killed almost a full shift of men. If the mine had been working with the full quota, few would doubtless have been saved. Only chance prevented it from making a much larger addition to the death rate of last year.

The number of separate fatal accidents in Great Britain was greater by 59 in 1913 than in 1912, an increase of 5.13 per cent. This was probably due to the greater number of days the mines were operated. In fact, the fatal accident rate per month really improved even if we assume that the British strike in 1912 only lasted a month. It actually exceeded that period about a week everywhere and in some places a longer time. A 4 per cent. improvement per month would be shown if the figures were based on a month's suspension.

But the increase in fatalities enumerating not separate accidents but individuals killed cannot be thus reasoned away, for explosions of coal dust or firedamp while numbering only 12 caused 461 men to lose their lives. Thus the loss of life mounted from 1276 in 1912 to 1742 in 1913, a gain of 466.

The Senghenydd explosion was, of course, largely the cause of this increased death rate, for in it 434 men lost their lives. It was the sole catastrophe of magnitude in Great Britain in the year except a much smaller accident at the Rufford shaft. Unfortunately we, in the United States, cannot point to as good a record in 1913. Our death list seems to point rather to decreased safety and only what we know about the efforts being made everywhere to make mining safe, gives us certain assurance that there is more cause for perseverance than there is for alarm.

### Arbeitswillige

A labor agitator in Germany must not use any such opprobrious title as "strike-breaker." He must term such a man an "*arbeitswillige*," a man who is willing to work. The Teutons are as sensitive to mere language as we are. How we also shrink from that word, "scab," which expresses a man who is willing to work when and where his mates are unwilling?

Much usage in unpleasant association will make *arbeitswillige* as offensive as strike-breaker, but this mild substitute of the Germans must be used with due discretion to persons only who are offenders against the moral sense of the public, or it will have as little meaning as "mugwump," which was a word to conjure with in the eighties and nineties and now is like "abracadabra," a relic of a past superstition.

If *arbeitswillige* is used to express disdain, the last estate of society will be worse than the first, for a willingness to work under all conditions will be regarded as evil. Are not *arbeitswilligen* altogether too rare in all countries, especially among the well-to-do?



## D. A. Thomas Back Again

The New York *Evening Journal* publishes the following interview with the English coal man:

D. A. Thomas, the Welsh coal magnate, who made two visits to America last year to look into the coal resources of West Virginia, with a view to acquiring coal properties here, arrived from England Mar. 6. Mr. Thomas stated that his visit is not for the immediate acquirement of more coal properties in West Virginia, but to complete arrangements for the building of a 1500-mile railroad in northwest Canada.

Accompanying Mr. Thomas on the *Lusitania*, were several Canadians, with interests in the Northwest, and he is to be joined in New York by other capitalists interested in the building of this road, which will open up a vast territory. The line will be known as the Pacific, Peace River & Athabasca R.R. Mr. Thomas became interested in this proposition when he made a visit to the Northwest last year. The road will pass through a large coal area, not at present developed, known as the Ground Hog\* coal fields, and as these lands lie near the Pacific, Mr. Thomas sees possibilities of placing the coal in the Pacific markets and said further:

"My interest in producing coal in Wales, is secondary to my interest in coaling depots all over the world. I recognize that if I am to keep them going successfully, I have to look ahead for supplies. The unsettled labor conditions in the Old World make it all the more imperative that I look to America for coal for the future. The labor situation in England is very much unsettled, and I would not be surprised if we have serious trouble with the miners in 1915."

Asked about the action of certain Congressmen from coal-producing states in urging the United States to enact legislation prohibiting the sale of any but American coal on the Panama Canal, Mr. Thomas said: "Such legislation is entirely unnecessary. Panama is the natural outlet for Ameri-

can coal, and American producers will unquestionably reap the benefits that will accrue through the operation of the new waterway. When one considers that in the past ten years, American coals have supplanted Welsh coals in the West Indies, one does not need to give serious consideration to the fear of competition at Panama from Welsh or German coals.

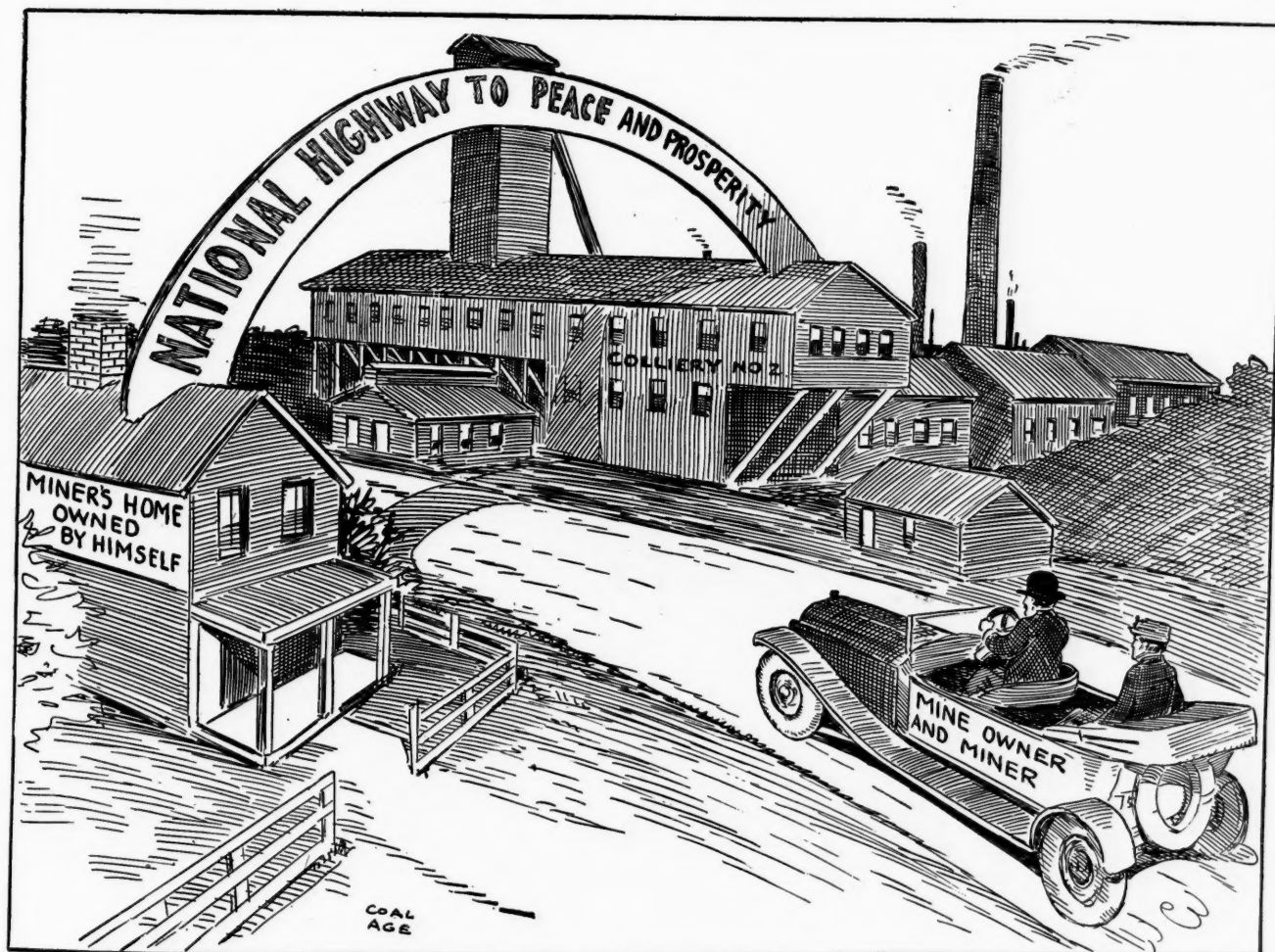
### AMERICAN COAL AND THE PANAMA CANAL

"The canal will play an important part in commerce, and I am therefore giving it a great deal of study. To have my coal interests international appeals very strongly to me, and I am hoping to extend my operations from time to time, so that my producing interests will be situated so advantageously from a geographical standpoint that my coaling depots will be assured of a constant supply of coal and at competitive prices, no matter where they may be located.

"I see a great future for your better grades of American coals from the operation of the Panama Canal. Your coals are at present impregnable so far as the West Indies are concerned. The west coast of South America will take a great deal of tonnage from American shippers when the canal is opened up, while at the present moment Americans are increasing their shipments to the east coast of South America and to the Mediterranean."

**Duty to Warn Miner Against Danger**—In a suit for injury to a miner, received in a mine explosion, caused by the lamp on his cap coming in contact with a charge of dynamite which his foreman had inserted in a hole in an overhead timber preparatory to blowing the timber out, the jury were warranted in finding that there was negligence in failing to warn the man against the danger, although he knew that the hole had been drilled in the timber for the charge; he having no knowledge that the explosive had been inserted. The foreman shouted a warning just too late to avoid the accident. (United States Circuit Court of Appeals, Second Circuit; Pennsylvania & Reading Coal & Iron Co. vs. Keshusky, 209 Federal Reporter, 197.)

\*For a brief description of this district see "Coal Age," Vol. 3, p. 993.—Editor.



THE ENTRANCE TO THE NATIONAL HIGHWAY



## Discussion By Readers

### An Acknowledgment

I wish to take this opportunity to thank you for publishing my inquiry in your issue, Jan. 5, p. 30, relative to water-bearing strata over a coal bed. The discussion by your readers was very helpful. After we have developed our mine I shall be glad to correspond with anyone who desires the benefit of our experience.

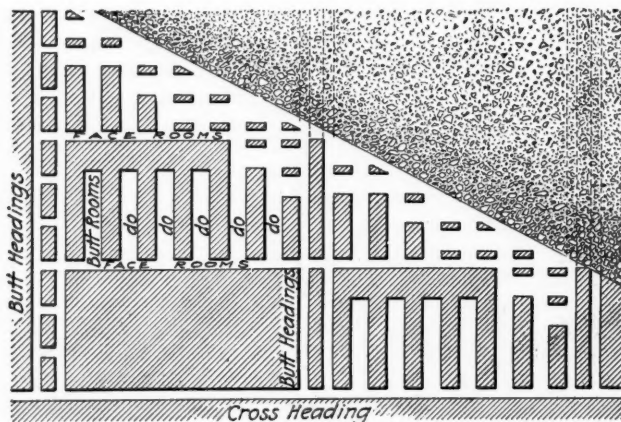
GEORGE MACPHAIL, Engr.,  
What Cheer Coal Mining Co.

Bay City, Mich.

### Longwall Mining Methods

*Letter No. 7*—Referring to the inquiry of "Bituminous," in regard to methods of longwall mining, in my opinion, the kind of longwall best suited to the conditions described would be a modified room-and-pillar system that may be described as follows:

The work is begun by developing a full section of eight pair of butt entries, or headings, driven on 300-ft. centers and forming a longwall face of, practically, 1400 ft. in length, a portion of which, only, is shown in the accompanying figure. Starting at the inby corner, or at the



A LONGWALL FACE, RETREATING SYSTEM

head of No. 1 or No. 8 butt entry, as the case may be, and retreating, face rooms are turned off the even butts only. These face rooms are turned on 120-, 140- or 160-ft. centers, depending on conditions. In the present case, I would drive the face rooms on 140-ft. centers.

Now, starting at the inby corner of the face rooms, butt rooms are driven on 42-ft. centers. These rooms are driven 21 ft. wide and 21-ft. pillars. In the retreating plan, the face rooms may be driven double, but care should be taken to drive the breakthroughs between them on the same centers, 42 ft. The butt rooms and breakthroughs may be driven while developing the face rooms, thereby increasing the production of coal, for the same cost of operation, and decreasing the cost per ton over what can be attained in the regular longwall-retreating system.

When Nos. 1 and 2 or Nos. 7 and 8 butts have been driven to the line or barrier, work is started on the retreating plan, by driving the butt rooms off the face rooms, on the upper side only, as described. The butt rooms are driven through the ribs, and three cuts are then made in the 21-ft. ribs separating them, these cuts being 18 to 20 ft. wide and leaving stumps of 7 or 8 ft., which are taken out at once with picks. The break line or line of fracture, is kept on an angle of about 60 deg. off the butts or 30 deg. off the face rooms.

This is an excellent system, in respect to economical haulage and ventilation. The air current can always be made to sweep the gobs, after passing the working face. The system has been tried and proved very successful, both on the semi-retreating and the full-retreating plan; but the latter, in my opinion, is the more satisfactory system to adopt, if given proper attention.

A similar system but worked with smaller entries and perhaps narrower rooms, can be found on the upper end of the Monongahela River, near Brownsville, Penn. The Bridgeport and other mines, in that vicinity, have tried a similar system that would have been more successful had they used longer rooms and greater entry centers. The system I have described gives an actual longwall-retreating face, with room-and-pillar development.

MINE FOREMAN.

Coal Center, Penn.

### A Plea for the Mine Foreman

I noticed in your timely editorial, Mining Education, COAL AGE, Jan. 10, p. 96, a reference to the efforts often made by large coal-mining companies, to secure a large available list of candidates for the positions of mine foreman and fireboss, while there are but comparatively few of these positions to be filled. And when these qualified men ultimately secure the position they seek, it is to work for a salary that is generally less than the pay received by a hard-working miner.

During the course of several years in coal mining it has frequently occurred to the writer that one of the fundamental weaknesses of the usual scheme of organization at coal plants consisted in the lack of proper incentive to the right type of men to become mine foremen.

I consider the mine foreman to be the keystone of the whole mining system. He is, in point of law and in fact, in exclusive control of the mine. True, he is guided and directed by his superiors to a large extent; but I believe that most practical mining men will concede that the mine foreman has more direct control over the cost, tonnage, safety precautions, etc., than any other individual in charge. But the point to which I wish to draw attention is that the financial and social inducements that are offered to the man aspiring to become a mine foreman are, to say the least, not flattering.

In the mines with which I have been acquainted, there were men who made more money than their foreman, and

who were without responsibility other than their own safety, and whose social position in the community was as high as that of their foreman. It is not necessary to go into details of the worries, difficulties, trials and tribulations of the mine foreman. Mining men all know what he is up against. I think, too, that if one stops to consider he can but realize there is little inducement for a man to prepare himself for such a position. Mine foremen, as a class, do not make as much money as railroad trainmen. They must live as close to the pit mouth as possible, and often work seven days a week and 12 or 14 hours a day. The mine foreman is regarded by his men as directly responsible for most of their troubles, and is too often so regarded by his superiors.

When one stops to consider that it is financially more profitable to run a cutting machine, work six or seven hours a day and come out of the mine with no responsibilities to worry over until the whistle blows the next morning, he is forced to conclude that either there should be a division of the responsibilities that now rest so heavily on the mine foreman, or his pay should be more commensurate with the salaries of other mine officials and the prices paid for other labor around the mine.

Any foreman can save or lose twice the amount of his salary each month in material and coal lost or recovered; and the same is true of a number of items, the loss of which would not be discovered by his employers.

I believe that the position of mine foreman as at present understood, requires ability of a high order. It may be said to the credit of our faithful mine foremen that they have no labor affiliations to stand out for their assumed rights and privileges, but depend on their own merit and ability as true workmen.

W. G. SRODES.

Moundsville, W. Va.

### Liquor and Safety in Mining

I have noted with strong approval some of the recent editorials and articles in COAL AGE, relating to the evil effects of alcoholic liquors on mine workers. Being the owner of a small anthracite-mining operation, I have had some opportunity of noting these effects, which, I believe, if fully known to owners and managers of mining properties, would cause them to stand aghast.

For some time, I have been considering the advisability of writing a letter to mine owners in this district or even the entire hard-coal field, suggesting the calling of a meeting to discuss the liquor question in its relation to the safe operation of coal mines. It has even occurred to me that it might be advisable to select one or more engineers of experience in coal-mining, for the purpose of making a careful investigation and inquiry into existing conditions in this regard and making a report that would show the exact relation of the liquor habit to safety in mining; and to make suggestions as to how the evil can be best overcome. I have hesitated to do this, because of the comparatively small interest I represent in the coal-mining industry. However, I write this letter in the hope that a way may be suggested by which the attention of those in control of the anthracite industry will be drawn to the matter and some action taken.

E. S. STACKHOUSE.

Shickshinny, Penn.

### Mine Legislation, Ohio

Referring to the recent interesting compilation of statistics in reference to the production of coal for 1913, COAL AGE, Jan. 10, I notice that, in several of the larger coal-producing states, the death and accident rates have materially increased. In our own state, Ohio, the increase in the death rate has been 25 per cent., notwithstanding the "safety first" campaign that has been waged so successfully throughout the state. One is led to wonder what might have been the result if these endeavors in the interest of safety in mines had not been undertaken.

The Ohio Legislature, now in session, have considered a number of measures having for their aim and purpose the safety of mining operations and the conservation of the coal. Among these measures may be mentioned the appointment of safety mine foremen; the regulation of solid shooting; and the provision of suitable emergency supplies in mines. The general tone of the legislation thus far passed by the assembly, under the leadership of Governor Cox, has given general satisfaction and leads both miners and operators to hope for the passage of further sane and up-to-date measures relating to safety in the mines. This is more earnestly hoped and expected, since the law-making body turned its attention toward the coal business.

Operators should not object to the passage of laws looking to the safety of life or the conservation of natural resources because additional expense would be incurred by the passage of such laws requiring improvements in the equipment of the mine and methods of operating. Any increase in the cost of operation must necessarily fall on the consuming public. The anthracite tax in Pennsylvania will naturally be added to the price of anthracite. Any wage increase always means an increase in the price of coal to the consumer.

If the public demands these measures for safety, the public must be willing to stand the expense, and I believe that whatever additional expense is required to reduce the death rate among miners, or the conservation of the coal supply will be gladly met where it rightly falls. It must be conceded that the coal business must pay a living wage to the miner and a proper return to the operator.

GEORGE N. LANTZ.

New Straitsville, Ohio.

### Mine Legislation, Arkansas

It was with great interest that I read the article in COAL AGE, Feb. 21, p. 314, entitled Safety in West Virginia. Although one or two of the rules given would not, perhaps, be applicable to coal mining in this state, I have seldom read a more complete set of instructions than what is there stated as "furnished to every mine foreman and assistant mine foreman." I am sorry to say that we have no such excellent rules and regulations in Arkansas.

Not to censure anyone in particular but with the hope of gaining better mining laws in this state, I submit a few facts that illustrate some of the conditions existing in all mines. The fact that these conditions exist is sufficient evidence that the state mining law is poor.

As has been mentioned in regard to other states, here also, too much is expected of the mine foreman. His



territory is too large to permit a daily visit to every working place in the mine. In many instances, the mine foreman's time is taken up with matters that should be looked after by someone else. He is obliged to devote much time each day to start an old pump working that is fit only for the scrap pile, instead of inspecting the working places and looking after the safety of the men in his charge. There are, I am sorry to say, some mine foremen who seldom go into the mine except on measuring days.

The fireboss, also, is required to cover too much territory. In many instances, he must examine in 2 hr. so many places that, if the examination were properly made, the work would require 4 hr. to complete. The fireboss often removes gas from the face of a room by brushing it out with a piece of canvas, regardless of the presence of any open lights. Everyone knows that such a practice is dangerous and that the gas should be removed by the air current only.

Speaking of brattices and stoppings, it cannot be said that we have any such things in these mines. There are what are called dirt stoppings," over which one can see into the next entry. Other stoppings are constructed of powder kegs, soft shale rock, sulphur balls, etc. These are the kind built on the main entries; in the rooms, there are no stoppings of any kind.

The rooms are driven up from 100 to 300 ft., and, in the latter case, there is sometimes a curtain hung on the entry to throw some of the air into the rooms; but this air is generally lost in the first crosscut 30 or 40 ft. from the entry, and never reaches the face. Where cross-entries are turned off the main entry, instead of a good door being hung on the entry, a curtain of 12-oz. ducking is used, which only throws a small scale of air into the cross-entries; the most of the air current goes over or under the curtain or passes it on either side.

The old workings are never examined, not even once a week. I have known cases where mines have not been examined after an idle day, and the men are allowed to go in and work as usual. On many haulage roads, water is allowed to flow down the middle of the track and where mules are used to haul the coal a miner, making a misstep, will go up to his knees in mud.

In conclusion, I wonder that any mine foreman or assistant foreman would neglect to perform his duty, under the good rules that are laid down for their benefit in West Virginia, regardless of the offer of a premium for so doing. While a word of encouragement goes far toward securing the faithful performance of duty, any neglect of duty should meet with a sufficient reprimand.

A. R. HAMFLETT.

Huntington, Ark.

## Study Course in Coal Mining

BY J. T. BEARD

### The Coal Age Pocket Book

**Caution**—In the calculation of all problems in mine ventilation, regard must be had to the conditions with respect to the power and the pressure producing or resulting from the circulation of the air in the mine.

Both the power and the pressure are commonly said to produce the circulation; but, as a matter of fact, it is the power that produces the circulation, while the pressure is the result and measured by the resistance of the mine or airway. Unfortunately, these factors do not vary alike, but the cube root of the power varies as the square root of the pressure; or, more simply, the cube root of the power ratio, in any mine or airway, is equal to the square root of the pressure ratio.

$$\sqrt[3]{\frac{u_1}{u_2}} = \sqrt{\frac{p_1}{p_2}}$$

For example, in order to double the pressure ( $p_2/p_1 = 2$ )

$$\sqrt[3]{\text{power ratio}} = \sqrt{2} = 1.414$$

$$\text{power ratio} = 1.414^3 = 2.828$$

In other words, if 10 hp. on the air produces a given pressure or water gage in a certain mine or airway, it will require  $2.828 \times 10 = 28.28$  hp. to double that pressure or gage.

**Use of Potential Factors**—Attention has been drawn to the potentiality of an airway or mine, in respect to the resistance it can offer to the passage of air, by virtue of its rubbing surface ( $s$ ) and its sectional area ( $a$ ). The potential of an airway or mine is the factor that determines the quantity of air such airway or mine will pass, for any given power or pressure. It is important, in the use of the potential, therefore, to consider whether the pressure or power is in question.

For every airway or mine, therefore, there is a power potential ( $X_u$ ) and a pressure potential ( $X_p$ ). The cube of the power potential is equal to the square of the pressure potential, for the same mine or airway, giving the equal values.

$$X_u^3 = X_p^3 = \frac{q^3}{u} = \frac{q^2}{p} = \frac{a^3}{k l o}$$

An inspection of these equal values shows that:

1. The quantity of air a given power will circulate varies as the power potential of the airway or mine.

2. The quantity of air a given pressure will circulate varies as the pressure potential of the airway or mine.

Hence, in comparing the circulations in different airways or mines, a constant power requires the use of the power potential, and a constant pressure, the pressure potential.

**Other Potential Formulas**—Transposing the values given above makes it possible to calculate the power or pressure required to circulate a given quantity of air in a certain airway or mine directly from its potential factor.

$$u = \left(\frac{q}{X_u}\right)^3 = \frac{q^3}{X_u^3}$$

$$p = \left(\frac{q}{X_p}\right)^3 = \frac{q^3}{X_p^3}$$

### The Coal Age Pocket Book

It is, likewise, possible to calculate the quantity of air a given power or pressure will circulate against any given potential factor representing a certain airway or mine, by simply multiplying the cube root of the power or the square root of the pressure by the proper potential of the airway or mine as expressed by the following formulas:

$$q = X_u \sqrt[3]{u}$$

$$q = X_p \sqrt{p}$$

A few examples will serve to make the use of these formulas clear and to show their practical application, in the rapid estimation of what is required in the proposed development of mines, in order to make suitable provision for their proper ventilation.

#### EXAMPLES FOR PRACTICE

1. If 25 hp. produces a water gage of 1.5 in., in a certain mine, what water gage will 40 hp. produce in the same mine?

**Solution**—Since the square root of the pressure or water-gage ratio is equal to the cube root of the power ratio, calling the required water gage  $x$ ,

$$\sqrt{\frac{x}{1.5}} = \sqrt[3]{\frac{40}{25}} = \sqrt[3]{\frac{8}{5}} = \sqrt[3]{1.6} = 1.17$$

$$\frac{x}{1.5} = 1.17^2 = 1.37, \text{ nearly}$$

$$x = 1.5 \times 1.37 = 2.05 \text{ in.}$$

2. It is proposed to provide for the circulation of 75,000 cu.ft. of air, in two generally equal splits, the airways including the return in each split being 6x10 ft. in section and about 8000 ft. long. (a) Find the power potential for the entire mine; and (b) calculate from that both the power and the water gage of the circulation.

**Solution**—(a) The sectional area of the airways, in this case, is  $a = 6 \times 10 = 60$  sq.ft.; the total rubbing surface in the mine,  $s = 2 \times 2 (6 + 10) 8000 = 512,000$  sq.ft. Substituting these values and that for the coefficient of resistance  $k = 0.00000002$  in the formula for power potential of mine,

$$X_u = \frac{2a}{\sqrt[3]{k s}} = \frac{2 \times 60}{\sqrt[3]{0.00000002 \times 512,000}} = 552.6$$

The power on the air required to circulate 75,000 cu.ft. of air against this potential is, then,

$$u = \left(\frac{q}{X_u}\right)^3 = \left(\frac{75,000}{552.6}\right)^3 = 2,500,000 \text{ ft.-lb. per min.}$$

The water gage, as calculated directly from the power potential,  $X_u = 552.6$ , is

$$w.g. = \frac{q^2}{5.2 X_u^3} = \frac{75,000^2}{5.2 \times 552.6^3} = 6.41 \text{ in.}$$

Or, the water gage may be found thus

$$w.g. = 2,500,000 \div (5.2 \times 75,000) = 6.41 \text{ in.}$$



## Inquiries of General Interest

### Study Question, Ventilation

Referring to the answer to the second examination question, COAL AGE, Feb. 7, p. 262, it would seem only natural to suppose that the quantity of air passing in the airway remains unchanged, and that this question should be worked by the first law of friction, which states that, the velocity of the air being the same, the pressure will vary directly as the rubbing surface; or, for the same cross section, directly as the length of the airway. This would give

$$4000:6000::0.5:x = 0.75 \text{ in.}$$

I have never seen the rule given in the answer to this question. Kindly explain.

FRED VINTON.

Heilwood, Penn.

The question to which correspondent refers reads:

Ques.—Assuming a single entry and air course, each 4000 ft. long, ventilated under a  $\frac{1}{2}$ -in. water gage at the entrance; calculate the water gage that would be expected when these entries are extended 2000 ft.

In the development of a mine, it is most natural to assume that the power on the air remains unchanged, the ventilating fan running at the same speed; but, owing to the increased rubbing surface, the mine resistance and the pressure or water gage are increased and, for the same power on the air, the quantity of air in circulation then varies inversely as the water gage, as stated in the answer.

It is a common mistake to apply the so called "laws of ventilation" without reference to what factor—velocity, quantity, power or pressure—remains constant. Correspondent assumes that the *velocity* of the air remains constant, which, for the extended airways, would mean a change of power on the air. But, assuming the power on the air is constant, both the pressure and the quantity of air in circulation will vary. For a constant power, the quantity varies inversely as the cube root of the length of the airway, and the pressure, inversely as the quantity. Therefore, in that case, the pressure per square foot and the water gage will vary directly as the cube root of the length of the airway, as stated in the answer.

### Mensuration, Sphere

We have been much interested in the following question and would like to ask for its correct solution in COAL AGE.

Question—Having a wrought-iron ball weighing 10 lb., it is required to find the diameter of a drill hole through the center of the ball to cut away one-half the weight of the ball, or 5 lb.

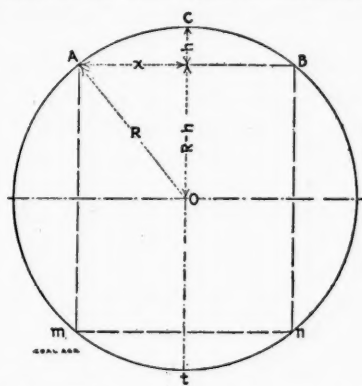
GEORGE W. FLANNIGAN, Mine Examiner,  
No. 9 Mine, Madison Coal Corp.

Carterville, Ill.

Although not of great practical value, the problem is a good drill in mensuration; and acquaints one with the relative volumes of a central cylinder, annular zone, and segments of a sphere. Without attempting, at this time,

to give their development, the following simple formulas are used to find the volume of sphere, its inscribed cylinder and the terminal segments of the sphere:

Referring to the accompanying figure, let  $O$  be the center of the sphere whose radius  $OA = R$ ; and let  $ABnm$  be the required inscribed cylinder whose weight,



FINDING THE VOLUME OF SEGMENT OF SPHERE

together with that of the two segments  $ACB$  and  $mtn$  must equal half the weight of the sphere. Call the height of each of these segments  $h$ ; and let the base of each segment, which is also the base of the cylinder, be a circle whose radius is  $x$ .

Now, assuming the mass of the sphere to be uniform throughout, its weight is proportional to its volume; and the question is to find the radius  $x$  or the diameter  $2x$ , such that the sum of the volumes of the inscribed cylinder and its two terminal segments will be one-half the volume of the sphere. The figure being symmetrical; about the common axis  $CD$ , it is necessary only to estimate on the relative volumes of the hemisphere, the half-cylinder and one segment. The height of the half-cylinder is  $R - h$ . The formulas giving their respective volumes are as follows:

$$\text{Vol. of hemisphere} = \frac{2}{3}\pi R^3 \quad (1)$$

$$\text{Vol. of half-cylinder} = \pi x^2 (R - h) \quad (2)$$

$$\text{Vol. of segment} = \frac{1}{3}\pi h^2 (3R - h) \quad (3)$$

Equating one-half the volume of the hemisphere with the sum of the volumes of the half-cylinder and one segment,

$$\frac{1}{2}\pi R^3 = \pi x^2 (R - h) + \frac{1}{3}\pi h^2 (3R - h) \quad (4)$$

But, it is evident from the figure that

$$h = R - \sqrt{R^2 - x^2} \quad (5)$$

Substituting this value of  $h$  in the previous equation, simplifying and finding the value of  $x$  in terms of  $R$ , gives, finally,

$$x = 0.6083 R$$

Practically, therefore, the radius of the inscribed cylinder is 0.6 of the radius of the sphere; or the diameter of the bore that will cut out one-half of the volume of the sphere is 0.6 of the diameter of the sphere.

Finally, taking the weight of wrought iron as 485 lb. per cu.ft., the volume of a sphere of wrought iron weighing 10 lb., is  $1728 (10 \div 485) = 35.63$  cu.in. The diameter of this sphere, calculated from formula 1, is  $D = 2R = 4.08$  in. and the required diameter of the bore is, then,  $0.6083 \times 4.08 = 2.48$  in.

## Examination Questions

### Miscellaneous Questions

(Answered by Request)

**Ques.**—(a) What are the principal features of a lamp for general use in a gaseous mine, and under what conditions is it rendered unsafe? (b) Why are some safety lamps more sensitive to gas than others?

**Ans.**—(a) A good working lamp must have a maximum illuminating power. The glass should be sufficiently tall and the flame set high enough in the combustion chamber that the shadows thrown on the roof and floor will not be too broad. While the lamp should have a good circulation of air to avoid any tendency to smoke and, also, to improve the light, it should be well protected against strong air currents by a bonnet covering the gauze chimney. The lamp should be simple in construction and consist of the fewest possible number of parts well fitted together and strong and durable. The weight of the lamp should be as little as is consistent with strength. The lamp should be provided with a good lock secure against tampering.

(b) Some safety lamps are more sensitive to gas than are others, because of having a larger gauze area and being unobstructed by a close bonnet that would restrict the free circulation in the lamp. The illuminant burned also affects the sensitiveness of the lamp; hydrogen gas and volatile oils giving a more sensitive but less persistent flame than other oils commonly used.

**Ques.**—(a) Give the advantages and disadvantages of the different kinds of explosives used in blasting coal and rocks in mines. (b) What precautions would you enforce for the handling of them? (c) What kind of a needle and tamping bar would you use, and why?

**Ans.**—(a) This question can only be answered briefly, in a general way. Explosives for use in coal mines may be classified under three general heads:

1. The comparatively slow burning, deflagrating explosives, of which black blasting powder is the best known representative. Black blasting powder has the advantage of producing by its explosion a gradually increasing pressure, which breaks the coal in larger fragments and is, for this reason, better adapted to the mining of the softer coals.

2. The detonating explosives represented by the glycerin type, of which dynamite is the best known. This class of explosives has the advantage of greater strength and is adapted to blasting harder coals and rock.

3. The so called flameless explosives are the highly nitrated class that produce little or no flame in their explosion. This characteristic makes the flameless explosives particularly adapted for use in presence of gas, in mines where the use of black powder would be dangerous.

The chief disadvantages of black powder are the flame produced by its explosion, the ease with which it may be ignited by an accidental spark from a lamp or the blow of a pick and its sensitiveness to dampness, which quickly destroys the strength of the powder. The chief disadvantages of the detonating explosives are their sensi-

tiveness to shock and the difficulty and danger of thawing the powder when frozen.

(b) No more of any explosive should be taken into the mine at one time than what is required for use in that shift. This should be carried in a metallic canister. All cartridges should be prepared at a safe distance from any lamp or flame. Holes must be charged and fired by an experienced person. Dynamite or other high explosive and percussion caps must be carried and kept in a safe place. Dynamite when frozen must be thawed slowly by an approved method.

(c) In order to avoid the danger of an accidental spark being struck in the use of an iron or steel needle or tamping bar, only a copper needle should be used when squibs are employed for firing the powder; and none but a wooden tamping bar should be employed for charging a hole.

**Ques.**—(a) How many 3-in. pipes will present a sectional area equal to that of one 12-in. pipe? (b) All of these pipes being of equal length, will this number of 3-in. pipes discharge more or less water, in a given time, than one 12-in. pipe, and why?

**Ans.**—(a) Since the sectional area of pipes varies as the square of the diameter, the number of pipes that will present the same area will be equal to the square of the diameter ratio. Or, in this case, calling the number of 3-in. pipes  $n$ ,

$$n = \left(\frac{12}{3}\right)^2 = 4^2 = 16$$

The same result is obtained by equating the values for the sectional areas of these pipes, taking  $n$  3-in. pipes and one 12-in. pipe. Thus,

$$n (0.7854 \times 3^2) = (0.7854 \times 12^2) \\ n = \frac{0.7854 \times 12^2}{0.7854 \times 3^2} = \left(\frac{4}{1}\right)^2 = 16$$

(b) Assuming the same head, the flow of water in each pipe will vary, approximately, as the square root of the fifth power of the diameter. Hence, the number of 3-in. pipes required to produce the same flow, under the same head, as one 12-in. pipe, will equal the square root of the fifth power of the diameter ratio. Then, calling the number of 3-in. pipes required  $n$ , the diameter ratio being  $12:3 = 4:1$ , we have,

$$n = \sqrt{\left(\frac{12}{3}\right)^5} = \sqrt{4^5} = 32 \text{ pipes}$$

The reason that sixteen 3-in. pipes, under the same head, will discharge less water than one 12-in. pipe, although having the same sectional area as the large pipe, is that the sixteen 3-in. pipes present four times the rubbing surface of the single 12-in. pipe. For the same head and area the flow of water in pipes varies inversely as the square root of the rubbing surface; or, since the total rubbing surface of the small pipes is four times that of the large pipe, the flow in the sixteen 3-in. pipes is  $1 \div \sqrt{4} = \frac{1}{2}$  that in the single 12-in. pipe.

## Book Reviews

**THIRTY-FOURTH ANNUAL REPORT OF THE DIRECTOR OF THE UNITED STATES GEOLOGICAL SURVEY to the Secretary of the Interior for the Fiscal Year Ended June 30, 1913.** 172 pp. + index. 5 1/2 x 9 1/4 in. 2 pl. 0 illus. Paper cover.

This report gives an outline of the work of the Geological Survey during the past year, a work which was somewhat hampered by a decrease in appropriation. However, as usual, a most creditable amount of work was effected. Already 38.9 per cent. of the whole area of the United States has been surveyed by this department of the Federal Government with the aid of state appropriations.

The allotment for coöperative work made by the State of Pennsylvania was only \$5528.19, whereas West Virginia contributed \$12,000, Ohio \$25,000, and Washington \$13,750. In fact, 11 states were more liberal contributors than Pennsylvania despite the importance of her mineral production.

The land classification board makes an extensive report leaving out, however, that particular table to which we made exception. Interesting tables are added, however, one showing a summary of coal-land classifications and valuations in force June 30, 1912 and 1913. The highest average price of coal lands is in Colorado, where the figure is \$59, the lowest in South Dakota, where it is \$11. These figures are interesting, but we must always remember that much coal land is listed at \$10 and \$20 which Mr. Ashley says is not worth that much, and some of which we may be sure is not worth a song. This decreases the average price by its inclusion as coal land.

SALES OF COAL LAND JUNE 30, 1912, TO JUNE 30, 1913			
Per Acre	Acres	Per Acre	Acres
Price		Price	
\$10	5,328.80	\$60	160.00
19	22.80	65	40.00
20	2,897.86	70	40.00
25	120.00	80	40.00
30	40.00	85	40.00
35	40.00	100	194.81
40	40.00	110	198.73
45	80.00	115	63.19
		Total 10,338.70	

These figures were obtained by a comparison of the totals in the two most recent bulletins.

We trust, however, that the present intention of the administration will continue and we shall replace purchase by lease. If these lease rates are small they will not largely exceed the costs of supervision and the question of what to do with the income will not arise. The surveys which coal valuation have made necessary have been of immense value and extremely creditable to the Geological Survey. We hope they will be pushed just as vigorously when valuation ceases. In fact, the work will be even better when less hurried.

**TESTS OF PERMISSIBLE EXPLOSIVES BULLETIN 66, BUREAU OF MINES.** By Clarence Hall and Spencer P. Howell. 313 pp. 5 1/2 x 9 1/4 in. 1 pl. 6 illus. Paper cover.

The bulletin gives details of the results of the tests made on all explosives declared permissible between May 15, 1909 and Mar. 1, 1913; bulletin 15 giving an account of those explosives which were approved before the former date.

It is interesting to note how rapidly the consumption of short-flame explosives is increasing. In 1902, only 11,300 lb. were sold; in 1907 the sales had already risen to 2,095,244 lb. The formation of the Technologic Branch of the Geological Survey and the creation of the Bureau of Mines caused a rapid development in the use of these explosives, so that the sales in 1912 were 18,149,977 lb.

We have calculated the increase by percentages year by year since 1903, the increase of one year over the previous being set against the later year of the two: 1903, 2454.5 per cent.; 1904, 110.7 per cent.; 1905, 69.5 per cent.; 1906, 48.7 per cent.; 1907, 36.6 per cent.; 1908, 0.6 per cent.; 1909, 324.1 per cent.; 1910, 32.2 per cent.; 1911, 13.6 per cent.; 1912, 35.1 per cent.

This list does not give a clear conception perhaps of what the Bureau of Mines and its predecessor accomplished because the early increase represented only a small increment in output. A few mines served to make the difference recorded. But the really noteworthy part of the list is that for 1908 and 1909. In 1908 the Technologic Branch of the Geological Survey had been started but had done no really effectual work. Many still believed that coal dust could not be exploded by black blasting powder shots without the pres-

ence of gas. The sale of short-flame explosives was at a standstill and some were being discredited. Then suddenly the increase rose under the fostering care of the Technologic Branch of the Geological Survey from 0.6 per cent. to 324.1 per cent. and the increase in sales has been high ever since and we have now more reliable permissible explosives than perhaps any other nation.

The amount of permissible powder should in the opinion of the authors be multiplied by 2, if we would obtain the equivalent quantity of powder of equal economic effect. The monograph claims that the use of permissible powder does less harm to the roof and permits the placing of timber closer to the face. The impulse being more rapid the effect is localized on the coal.

New methods have been adopted in testing. Two tests have been dropped, it having been found that explosives passing the other tests never failed in these two and that therefore they were not necessary. But in order to test the cartridges more truly under working conditions, they are fired in their commercial wrappers and not in tin foil. The paper contains no oxygen and the whole charge is increased in carbon by its addition. As a result less complete combustion results, more carbon monoxide is formed and the heat of combustion and the consequent pressure is reduced. As the presence of coal around the shot and the dust in the hole increases the carbon, decreases the carbon dioxide and decreases temperature and the pressure, it is a pity that a way has not been found to test the pressure developed under working conditions, but we suppose that is asking too much. The suggestion is worth considering, however.

Further variation is found, due to the formation of hydrogen in the blasting holes in mines, as much as 6.8 per cent. being found. As this is probably formed by dissociation of water, it must have an immense cooling effect on the flame and would offset "any increase in the duration of the flame caused by the coal entering into the explosive reaction."

There is so much that is of interest in this book that it is somewhat troublesome to review. We advise the reader to read it with care as it does much credit to the authors and contains much that is new and valuable. Of course the bulk of the book is intended for reference and comparison only.

**COMPRESSED-AIR PRACTICE**—By Frank Richards. IX + 326 pp. 6x9 in. 96 illus. McGraw-Hill Book Co., Inc., 239 West 39th St., New York City. Cloth boards. Price, \$3.

No one who reads "Compressed-Air Practice" will declare Mr. Richards commercial. In his conversational style he ends his preface with the remark "Catalog 'literature' and auctioneer talk have their place but not here" and the promise thus made is kept throughout the book, not we think entirely to the writer's interest. The book tells us nothing about the design of compressors. It is impossible to do this without illustrating some types on the market and Mr. Richards has therefore eschewed them all.

So after giving consideration to the thermo-dynamics of compression, theoretical and practical, he gives only the barest generalizations on the details of construction. Then he describes the turbo-compressor, the Taylor hydraulic compressor and the Humphrey pump. Two chapters follow on the power cost of compressed air and on power from that source; the air receiver and pipe friction are then treated and also the economy of reheating the air.

Compressor and receiver fires are discussed and side lines for the compressor are then treated at some length. Apparently the author is anxious to introduce compressed-gas distribution into our large cities instead of the present low pressure. Electric air drills, the air lift, the use of air in hammers, such as have hitherto utilized steam, diving bells and caissons, the air jet, sand blast and the cement gun all receive consideration and the book ends with an account of methods of liquefying air.

The inefficiency of the air receiver as a cooling and drying device is discussed and the author's argument is well sustained. The small area exposed to the cooling influences, the short time the air is in the receiver, the absence of impinging surfaces on which water can be deposited, all serve to make the receiver of little value for cooling or drying the air. For this reason compressed-air pipe lines are always fitted with large water traps.



# Coal and Coke News

## Washington, D. C.

Under the influence of the Wilson administration bills to regulate the development of government owned lands in Alaska have been prepared by the Chairman of the Public Lands Committees in both Houses of Congress in consultation with Secretary Lane of the Department of the Interior and will be pressed forward as rapidly as possible as companion pieces to the Alaska railroad legislation. They are designed to make available for immediate development treasures in coal, oil, phosphate and potash deposits.

Drafted along the lines recommended in Mr. Lane's annual report, the bills provide for the leasing of public lands under rigid restrictions to guard against monopoly and to insure full development.

The law to govern oil land leasing would provide that the Federal Government issue a permit for 2560 acres, which would give the possessor the exclusive right to explore for oil in this territory for a period of two years, during which time exploration work aggregating 2000 feet in depth must be done. If oil is discovered, the permittee would be entitled one-fourth of the land in fee, the remainder of the land to remain with the Government and be subject to lease in small tracts upon a royalty basis.

Under the proposed leases or patents granted no drilling of wells could take place within 200 feet of the outer boundaries of the lands leased or patented, and provision is made for general regulations requiring precautions to prevent waste of oil or the entrance of waters into the oil sands or oil-bearing strata. Forfeiture of the lease would be the penalty for violating these conditions and forfeiture could be effected through court procedure.

It is proposed that the coal lands of the country, which are all in great part classified, be sold at present, in small blocks, but provision would be made in the bills for leasing them, any holding not to exceed 2560 acres. It also would provide that for strictly local and domestic needs limited permits may be granted for tracts not to exceed ten acres for a period of ten years.

To insure against speculative holding, a small annual rental per acre will be charged. Similar provisions adapted to the different conditions are proposed as to the production of phosphate and potash.

\* \* \*

After an unexpectedly long delay the Senate Committee which was charged with the duty of investigating conditions in the West Virginia coal strike region has filed a report without, however, making any definite recommendations. The recommendations are withheld because of the fact that, as stated, conditions are now quiet in the disturbed region while Congress in the original resolution of inquiry did not call for any specific suggestions. The report does not take as drastic a position as had been expected but among the "contributing causes" which led to trouble it mentions the following:

"The failure of the operators in the Paint Creek district to renew their expiring contract with the United Mine Workers; the determination of the coal operators under no circumstances to recognize the miners as an organization or union, and the equal determination of the miners to organize and form a union, a right as they claim guaranteed to them without discrimination by the laws of West Virginia; the employment by the operators of mine guards, many of whom were aggressive and arbitrary; mine guards in the employment of the operators acting as deputy sheriffs and clothed with the authority of the law; the failure of the civil authorities to attempt even to preserve peace and order at the beginning of violence and permitting things to drift from bad to worse without vigorous interference and assertion of authority; discontent among the miners occasioned by no opportunity to purchase homes, no cemeteries except upon the company's grounds; post offices located in the company's stores; private roads only to the schools and stores; the disposition of the coal operators to keep strict espionage of all strangers who entered the district and to exercise their right of private ownership of this large district and to exclude from it all persons objectionable to them. These may be stated as some of the immediate contributing causes."

## Harrisburg, Penn.

The operating cost in taking a ton of anthracite coal from the Schuylkill district to Philadelphia is 44.698 cents per gross ton on the Philadelphia and Reading R.R., while transporting a ton on the Pennsylvania from the Schuylkill, Lehigh and Wyoming Regions costs from 49.816 to 77.42 cents.

These figures are found in the report of Price, Waterhouse & Co., expert accountants who have been investigating the transportation charges on coal shipments from the anthracite region to Philadelphia for the Public Service Commission. The report was made public on March 6, by the commission, which has fixed March 30 as the day when argument will be heard on the rate inquiry at Philadelphia.

Incidentally, it is interesting to note in connection with the report that the freight rates of the various railroad companies per ton of coal from the anthracite region to tidewater at Philadelphia are as follows:

"From the entire Schuylkill region over the Reading or Pennsylvania lines to Philadelphia \$1.70 per gross ton.

"From the Lehigh region in connection with the Reading or Central R.R. of New Jersey, via Allentown, \$1.86 to Philadelphia; over the Lehigh Valley R.R. via East Penn Junction, \$1.86; to Germantown, either route, \$1.96; to Chestnut Hill, either route \$2.06.

"From the Lehigh region, over the Lehigh Valley or Central R.R., via Pennsylvania R.R. connecting at East Philadelphia Junction \$1.80.

"From the Wyoming region, Central R.R. or Lehigh Valley, over the Reading \$2.10; over the Pennsylvania, via East Phillipsburg Junction \$1.80."

To establish an adequate basis for the determination of the cost of transportation the accounts for the twelve months ending May 31, 1913, were examined, and the estimate of cost includes expenditures for (1) operating expenses, (2) taxes, (3) hire of equipment and (4) miscellaneous. The inquiry of the accountants, however, has been restricted to the question of operating costs and taxes, and they have not dwelt in any way with the question of investment and return thereon, a highly important factor.

In case of the Philadelphia and Reading, the records of revenues by divisions are not maintained, but in the case of the Pennsylvania it appears in the aggregate the revenue of the divisions involved in the anthracite coal traffic amounted for the year under consideration, to \$73,917,654, and the operating expenses amounted to 71.25 per cent. of the revenues, leaving 28.75 per cent. to provide for return on investment and for any reserves for extraordinary purposes. While there are no figures as to the value of the investment now available, it seems probable that such a percentage would not be greatly in excess of a fair return.

"In the case of the two railroads in question (Philadelphia & Reading and the Pennsylvania), a considerable proportion of the subdivision of the expenses between passenger service and freight service was readily obtainable from the books in proper form. In some particulars, however, we have had to take exception to the methods of subdivision, and, in the case of the Philadelphia & Reading R.R., the subdivision is not fully carried out by the company and had to be completed by ourselves. The subdivision of the cost of freight service among merchandise, anthracite, bituminous coal and coke was for both companies carried out in the main by ourselves on the basis of data secured from the records. So far as we have been able to ascertain, neither company determines the cost of the anthracite traffic separately from the freight traffic, but each secures concurrently a considerable amount of pertinent information."

The report says that the terminal cost of anthracite traffic is relatively low, by reason of its being handled in bulk and usually with mechanical aid. On the other hand the value of the property employed in its terminal handling is an important item and calls for due consideration in the determination of the fair return that the traffic may be expected to yield.

The report states that the whole problem of determination of costs for rate purposes is still in an early stage of development.

## PENNSYLVANIA

## Anthracite

**Scranton**—A demurrer to the action in equity brought by the People's Coal Co., of this city, to test the constitutionality of the anthracite coal tax act of 1913, was filed by the Attorney General's Department on March 9, in behalf of Auditor General Powell and State Treasurer Young, the accounting officers of the Commonwealth. No steps for the collection of the tax have been taken by the State since the suit was brought, although all the reports are stated to be in hand and the bill can be sent out. The demurrer declares that the Dauphin County court, wherein the suit was brought is without jurisdiction to entertain the bill of complaint; that the bill does not state any facts, entitling it to belief; that the bill contains "many wholly irrelevant, immaterial, scandalous and impertinent matters and does not show on its face that the plaintiff is entitled to any relief which it seeks" that nothing is shown entitling the plaintiff to a permanent injunction; that the bill does not show the act to be unconstitutional in any respect. Date for argument will be fixed later on.

**Hazleton**—In the last year four companies in the 11th anthracite district did not have any fatal accidents at their collieries. They were Coxe Bros. & Co., Inc., Pardee Bros. & Co., the Harwood Coal Co., and the Upper Lehigh Coal Co.

According to the annual report of David J. Roderick, the mine inspector, there was one death for every 293,788 tons of coal mined, against one for every 275,000 tons the previous year. The inspector is gratified over the reduction in fatalities, and points to this record as one of the signs that more preventive measures are being taken.

## Bituminous

**Shenandoah**—The Buck Mountain vein of 15 ft. of fine coal was struck on Mar. 5, by Dolan Bros., tunnel contractors for the Locust Mountain Coal Co. The company will begin shipments as soon as the new breaker, in course of construction is completed. The unexpected strike completes the tunnel and saves thousands of dollars for the company.

**Harrisburg**—The Public Service Commission has recommended that an evening service between Pine Grove and Outwood be installed for the accommodation of the miners residing along the S. & S. branch of the Reading R.R. The schedule calls for a train that will reach Outwood not later than 6 o'clock p.m. This service will take the miners home directly from the mines and they will no longer be compelled to walk several miles. The Commission found that it would not be reasonable to order a morning service from Outwood, because it would involve a net loss of \$25 daily to the Reading Co.

**West Pittston**—Members of the Continental local of the United Mine Workers have made an investigation of conditions in the territory covered by its activities, and have discovered much acute poverty among the people. This report was made at a meeting of the local, and it was decided to empty the treasury of the local to alleviate the distress. There is about \$4000 in the treasury and this money will be expended in keeping the families of the men who are in need, as well as in taking care of those who are outside the organization. The members of the Continental local have not been employed for some time. The mine has been shut down for repairs, the closing down following the announced presentation of some grievances on the part of the workers.

## KENTUCKY

**Frankfort**—The Kentucky Railroad Commission has entered an order in the case of the Paducah Light & Power Co. against the Illinois Central Railroad Co. reducing rates of coal from the western Kentucky field to Paducah from 80 to 60c., and requiring restitution of \$1,729.98 for overcharges made on coal from that section by the railroad.

**Owensboro**—It is understood that the Fern Hill mine, near this city, has been sold to the Deep Water Coal & Coke Co., of Evansville, Ind., which has been acquiring various coal properties in this section during the past two months, for \$87,000.

**Louisville**—The scale committee of the United Mine Workers of America, District No. 23, was in session here all this week, formulating the wage scale which will be presented to the operators in the union (western Kentucky) section of the Kentucky field shortly as a basis for negotiations. The committee's deliberations were attended by about sixty delegates from the field. L. B. Walker, of Central City, Ky., presided. The wages scale to be adjusted will cover the next two years.

## TENNESSEE

**Jacksboro**—After a year of prospecting the Lindsay Coal Co., of which H. B. Lindsay is president, operating near Caryville, Tenn., struck a fine vein of coal 4 ft. thick. The vein was struck after penetrating the mountain 1600 ft. with a 12-ft. entry. The company will at once enlarge its equipment and operate the vein on a large scale.

**Knoxville**—The executive committee of the Southern Appalachian Coal Operators' Association met at its rooms last week, reflecting J. E. McCoy as Secretary, and discussing a number of matters of importance, including the rate adjustment covering the section, which is now pending before the Interstate Commerce Commission. The committee was composed of President E. C. Mahan, James R. Wooldridge, T. I. Stephenson, Alexander Bonneyman, N. B. Kenney, H. L. Cory, L. I. Coleman, L. I. Coleman, W. C. Tucker, H. S. Pless and A. H. Wood.

## ILLINOIS

**Marion**—The new washer of the Peabody Coal Co. at mine No. 3 is now in operation and is the latest and most up-to-date washing plant in the state, and at the same time is considered the most economical. It makes only three sizes of washed coal, No. 1 and No. 2 nut, and washed screenings.

**Perry County**—This county is at present the scene of a good deal of activity on the part of St. Louis capitalists, who already have secured options on 5000 acres of virgin coal lands in that section, and are seeking leases on 15,000 more. Joseph Crawford, President of the Murphy-Wall Bank & Trust Co., of Pinckneyville, Ill., represented the St. Louis men in the deal. Prospecting for coal will begin as soon as the options on 20,000 acres have been secured. Prospectors also have optioned a tract of coal land north of Pinckneyville. All of the area referred to is in proximity to the proposed electric road between Springfield and Duquoin, which will provide an outlet for mine products.

**Belleville**—R. W. Ropiequet, who was primarily the organizer of the 5th and 9th District Operators' Association, and who has been prominent in the affairs of the operators in the 5th and 9th districts for the past four years, has resigned and in the future will have nothing more to do with that organization. Mr. Ropiequet has done more for his organization than has been accomplished for a similar body anywhere in the United States by any one individual. He compelled the Illinois Central Railroad to build several thousand coal cars for the mines in his district on that road, and, in losing him, the coal trade will miss one of its most valued and competent men.

## INDIANA

**Evansville**—Manager Henry F. Allen, of the Deep Water Coal & Coke Co., which recently took over a number of mines in the Western Kentucky district, announced recently that the company's policy would be to operate its mines with union labor exclusively. This announcement has been received with much enthusiasm by labor leaders, who are attempting to strengthen their organization in Western Kentucky.

## KANSAS

**Topeka**—The Kansas Public Utilities Commission will hold another meeting in March for the purpose of hearing additional evidence in the mine-run case which has been pending for the past few months. The hearing will be held about Mar. 14, and is expected to result in some decision in the case.

**Leavenworth**—Fire originating in the tippie of the Home mine of the Home Riverside Coal Mining Co., destroyed the buildings with a loss of \$25,000. Men working in the mine escaped through the Riverside shaft, two miles away. Three hundred and fifty miners were employed and will be out of work pending the rebuilding of the tippie and other structures included in the loss. About two-thirds of the loss was covered by insurance. The burning timbers dropping into the mine did not set fire to the buntings and the mine itself was uninjured. Twenty mules were driven underground two miles to the Riverside shaft and saved. A pump was installed and a temporary hoist operated, in order to keep the shaft clear of water. The Home is the oldest mine now operated at Leavenworth.

## MISSOURI

**Webb City**—Missouri State Mine Inspector, George Hill, recently instructed deputies in the Southern district to enforce rigid observance of the eight-hour law. Communications to this effect from Mr. Hill were read at the meeting of district inspectors.



## MISSOURI

**Kansas City**—Four coal company members of the Southwestern Interstate Coal Operators' Association have filed suit against President Chas. F. Keith of the Association, for alleged unwarranted payments amounting to not less than \$40,000. Referring to certain funds of the Association the complaint states: "That the Association received no consideration therefor nor benefit therefrom; that they were foreign to the Association purposes and wholly unauthorized by it." The four companies involved in the procedure comprise the Bache-Denman interests and are the Prairie Creek Coal Mining Co., the Mammoth Vein Coal Co., the Coronado Coal Co., and the Kali-Inla Coal Co. Mr. Keith is president of the Central Coal & Coke Co.

**Kansas City**—The joint meeting of a committee of operators and miners held at the quarters of the Southwestern Interstate Coal Operators' Association in the Keith and Perry building on March 4 and 5, failed to result in an agreement on disputed points of the Kansas workmen's compensation law, passed in 1913. A resolution was adopted, recommending the appointment of an arbitration committee, to act as provided in Section 24 of the compensation law. This committee, should it at any time be unable to agree on the interpretation of any clause in the law, shall have the power to appoint one man as referee, and his decision shall be final. The arbitration committee is to be composed of an equal number of miners and operators. State Labor Commissioner, William L. O'Brien, of Kansas, attended the hearings in Kansas City, as did representatives of the operators and of employees. It was finally decided, after the meeting had gone two days, that the committee would ask the operators to reach some definite interpretation of the law and present it to the committee. Another meeting of operators and miners will be held in Kansas City later in the month. The mooted points were chiefly, when shall payment in case of injury to a miner begin; shall compensation be based on the gross or net earnings of the miner, and what does "concurrent employment" mean?

## COLORADO

**Denver**—The Federal Strike Investigating Committee have secured a sworn statement from Arthur Langowski, 21 years old, to the effect that he receives \$3 a day from the coal operators while exploding dynamite for the United Mine Workers of America. When questioned by the committee, he denied being a spy in the ranks of the union, although he admitted that he was "watching both sides" and received pay from both.

A compulsory arbitration law for the settlement of disputes between coal operators and their employees, is one of the recommendations of the committee. This proposal is fathered by Representative Howard Sutherland, of West Virginia, who takes the position that coal is a public necessity. It is possible that the enactment may lead to a Federal statute similar to the Canadian "Dispute Act," which includes coal-mining industries in which controversies between labor and capital must be submitted to boards of mediation.

## WASHINGTON

**Olympia**—A statistical report of coal operations in the state of Washington during the past year has been compiled by James Bagley, state inspector of coal mines. The report shows that 3,823,837 short tons were produced, as compared with 3,346,946 during the year 1912, an increase of 476,901 short tons. An increase of 26,843 tons of coke was also indicated, 75,732 tons being produced as against 48,889 in 1912. The report shows also that the total number of men employed in the mines during 1913 was 6065, as compared with 5673 employed during 1912, an increase of 392 men.

## CANADA

**Montreal**—According to the preliminary report on the mineral production of Canada during 1913, prepared by John McLeish, chief of the Division of Mineral Resources and Statistics, of the Department of Mines, and presented at the 16th annual convention of the Canadian Mining Institute, recently in session at Montreal, the total value of the output was \$144,031,047, as compared with \$135,048,296 in 1912. The production of coal was 15,115,089 tons, as against 14,512,829 tons in 1912; the year being marked by an increased production in Nova Scotia, New Brunswick and Alberta, and a diminution in the output of Saskatchewan and British Columbia. The decrease in the latter province amounted to almost one-half million tons and was due largely to the continuance of the strike in the Vancouver Island mines.

The total output of oven coke in 1913 was 1,517,133 tons, made from 2,147,913 tons of coal, of which 1,598,912 tons were mined in Canada; 549,001 tons imported.

## PERSONALS

V. S. Veazey has recently been appointed Chief Engineer of the McVell Coal & Coke Co., of Glen Jean, W. Va.

George P. Wilson, of Philadelphia has been appointed chief of the bureau of tariffs by the Public Service Commission, the appointment to date from March 16.

George A. Gallinger, of Pittsburgh, has been placed in charge of the Pneumatic Tool Department of the Ingersoll-Rand Co., with the title of Manager of Pneumatic Tool Sales. His headquarters will be at 11 Broadway, New York City.

Joseph Huddleston, a coal operator of Excelsior, W. Va., and Mrs. Georgia C. Bayman, of Huntington, W. Va., were married last week in Jeffersonville, Ind. Mr. Huddleston is a prominent figure in the field where his mines are located.

Irving R. Gard, late mining engineer for the Canadian Collieries (Dunsmuir), Ltd., of Victoria, B. C., Canada, has been placed in charge of the properties of the Mecca Colliery Co., with headquarters at Eagle, W. Va. Mr. Gard assumed his duties Feb. 15.

K. U. Meguire, of Louisville, Ky., President of the Harlan Coal Mining Co. and of the Sneed & Meguire Coal Co., left recently for a vacation trip to Florida, where he will recuperate from his labors on the workmen's compensation bill, which is before the legislature.

Sheffield Ingalls, Lieutenant-Governor of Kansas, allowed his option on a mine near Atchison, Kan., to expire on Feb. 15, and the plant probably will be purchased by a power company. W. B. Collett is representing the latter in new negotiations. Gov. Ingalls was unable to interest capital in the mine.

F. M. Sackett, of the North Jellico Coal Co., an operating concern, and of the Byrne & Speed Coal Co., of Louisville, is the chairman of a committee which is working to secure the donation for the erection of a public auditorium with the refunds of excess rates being made by a local telephone company to its subscribers, and is meeting with considerable success in the campaign.

## OBITUARY

A. H. Reeder, president of the Stonega Coal & Coke Co., of Stonega, Va., died in Philadelphia a few days ago following an operation for blood-poisoning, which was due to frost-bite suffered while hunting. Mr. Reeder was well known in the coal fields of Western Virginia and Eastern Kentucky.

Edward Wells, aged 82, president of the Hollenback Coal Co., died on Mar. 8, at his residence in Wilkes-Barre, Penn. He was a director in a number of Eastern banks, and a trustee of the Wyoming Historical and Geological Society. Mr. Wells is survived by his wife, one son, and his brother, John Wells Hollenback, a prominent coal-land owner.

John Yoeman Boyd, one of the most prominent coal men of the State of Pennsylvania and a member of the first Railroad Commission of Pennsylvania, died of heart trouble, on March 9, at his city residence, in Harrisburg, Penn. He was in his 52nd year. Surviving Mr. Boyd are his wife and four children.

Mr. Boyd was born in Danville, Penn., Aug. 9, 1862. He was prepared for college at the Harrisburg Academy and then entered Princeton. Since graduation he had been identified with the large Boyd coal interests and was heavily interested in Southern states. Mr. Boyd having succeeded his father who was a member of the noted Conyngham, Stickney & Boyd coal firm, of Philadelphia.

When the Railroad Commission of Pennsylvania was created, Edwin S. Stuart, then Governor, selected Mr. Boyd as a personal appointment, desiring one who was accustomed to large business matters. He was reappointed, but resigned because of the press of personal affairs, the management of his father's estate having fallen largely upon him. His resignation was the occasion of a tribute by Governor Stuart to his service in behalf of the State and of formal action by the other commissioners.



## CONSTRUCTION NEWS

**Kansas City, Mo.**—The Central Coke & Coal Co., of this city, will install in its colliery at Rock Springs, Wyo., one 50-hp. and two 150-hp. motors and control equipments which have been ordered from the General Electric Co.

**Lorain, Ohio**—The announcement is made that the work of erecting the new unloading machine at the B. & O. docks, Lorain, will not be started until fall. When completed the machine will be one of the fastest on the Great Lakes.

**Scranton, Penn.**—The Hudson Coal Co., of this place, will install in its power station a 435 kv-a. motor-generator set and switchboard, and will place in operation in the mines three 7-ton, 30-in. gauge electric mining locomotives, which equipment has been purchased from the General Electric Co.

**McAlester, Okla.**—About \$1,000,000 is to be spent here in the immediate future by the Rock Island R.R., according to a recent announcement. Much of this will go toward improving the mines now operated by the company, while two new operations are to be sunk on recently acquired coal lands. The number of miners to be employed will be increased largely.

**Hazard, Ky.**—The Kentucky-Jewel Coal Co. here have completed a first-class coal-mining plant three miles below here on the Lexington & Eastern R.R. and are now shipping 40 cars per day. The company announces a number of increases by Apr. 1. One hundred and fifty miners' houses are nearing completion. The coal field around Hazard is attracting much attention.

**Wellsburg, W. Va.**—Work has been started on the construction of ten new double blocks of houses at the La Belle Mine of the West Virginia Pittsburgh Coal Co. The United Mine Workers called a strike at this mine in November, and the influx of non-union miners since that date has been so great that the company was compelled to build new houses to accommodate them.

**Pittsburgh, Penn.**—The Pennsylvania Coal Co. of this city, will place in operation in substations considerable new electrical apparatus comprising one 500-kw., one 300-kw. and two 200-kw. two-unit three-bearing motor-generator sets; three 50-kv-a. and nine 100-kv-a. transformers; one 150-hp. and three 300-hp. motors; three control equipments, switchboards and accessories. The contract for all the apparatus has been placed with the General Electric Co.

**McAlester, Okla.**—Improvements contemplated by the Rock Island R.R. in this field in the near future include two new shafts and two additional slopes. One of the new shafts will be between Hartshorne and Gowen, 650 feet deep. The other will pierce to a depth of 800 feet, being at Alderson. Both slopes will be near Hartshorne. Mine No. 8 at Hartshorne probably will be abandoned. It has been sealed up for the past month, because of a recent fire. About 1500 new miners will be employed because of the additional capacity. This is expected to be in the neighborhood of 6000 tons daily. All of the new shafts will be equipped with steel tipples, late screening devices and other approved equipment. It is said that the Rock Island will utilize all of the facilities required by law, and will adopt the "safety first" idea extensively. Many of the old mines have been only partly equipped with modern casualty-prevention machinery, because of the difficulty of the task. The mines just being sunk, however, will embody all approved plans for "safety first."

## INDUSTRIAL NEWS

**St. Clairsville, Ohio**—The Hutchinson Coal Co. has filed a mortgage of \$1,000,000 with the Security Trust company, of Wheeling, W. Va., to secure a loan on coal properties in Belmont County, Ohio and Mason and Harrison Counties, W. Va.

**Scranton**—The Continental Miners Local of the U. M. W. of A., has voted \$4000 from its treasury to aid members of the local who have lost their mine tools in the settling at that colliery. The men are unable to obtain work elsewhere because of their lack of tools.

**Easton, Penn.**—One of the largest mortgages filed at Easton for some years was that of the Lehigh Coal & Navigation Co., for \$40,000,000. It is a consolidated sinking-fund mortgage, the principal of which is due on Jan. 1, 1954. The Pennsylvania Co. for Insurance on Lives and the Granting of Annuities is trustee for the bondholders.

**Columbus, Ohio**—At the annual meeting of the stockholders of the Ralston Steel Car Co., of Columbus, J. E. Tesseyman resigned as vice-president and general manager, being succeeded by Anton Becker. Other officers were reelected. The company manufactures steel cars for coal carrying and has had a very prosperous year.

**Williamstown, Penn.**—Property on which the Summit Branch Coal Mining Co., Lykens Valley Coal Mining Co., Northern Central Railways Co., and Isaac D. West were tenants, was sold on March 5 by the sheriff of Dauphin County to the Susquehanna Coal Co., for \$2600. There were mortgages amounting to \$220,364.25 against the property.

**Wilburton, Okla.**—The Great Western Coal Co. of this place has been placed in the hands of a receiver. James Elliott, president of the Hairy Ola Mining Co., was made receiver. The company, capitalized at \$200,000, is said to be in fairly good shape, despite the receivership, and is expected to resume operations in the near future. About 200 men are employed.

**Sharon, Penn.**—The Carnegie Steel Co. reports successful results of the experiments they have been conducting with pulverized coal in an openhearth furnace. With this new fuel, the quality of the metal was not only higher, but more heat was secured in much less time than required by the old method. At present, the Carnegie Co. have only one such furnace in operation, but they have signified their intention of erecting others immediately.

**Spadra, Ark.**—The Clark-McWilliams Coal Co., of this place, has purchased all of the holdings of the Southwestern Anthracite Mining Co., of Scranton, Penn., at Hartman, Ark. Included in the deal is 386 acres of coal lands, in John County, estimated to hold 2,000,000 tons of coal. The purchase price was not announced. The Clark-McWilliams Coal Co. will erect a \$50,000 plant, with a 500-ton daily capacity, in the immediate future. The deal is the largest consummated in Arkansas during the past few years.

**Zanesville, Ohio**—Because of lack of orders and uncertainties of the new mine-run law a number of mines in the Zanesville and Cambridge districts of Ohio have closed down permanently. The granger mine of the Pan-American coal company located at Buckeye, south of Zanesville, was closed down and the new mine to be opened by the company on Turkey Run will be abandoned for the time being. The Peabody mine at Shawnee; the Jones Mine at Corning and Mine No. 24 at Jacksonville were also closed down. The closing of these mines threw out of work about 2500 miners.

## NEW INCORPORATIONS

**Melbourne, Ill.**—The Melbourne Coal Mining Co. has been incorporated here, capital \$3000, by B. S. Moulton, A. L. Chambers and Louis M. Davis.

**Pittsburg, Kan.**—The Interstate Operators' Coal Co. has filed articles of incorporation here. The capitalization is placed at \$10,000. The company proposes to enter the coal mining field.

**Fayette, Mo.**—The Howard County Coal Co., capital \$4000, has been incorporated here, with C. W. Watts, President, and Frank Grimes, Secretary. They have purchased and will develop the Russell property.

**Brilliant, Ohio**—The Blyth Coal Co. has been incorporated with a capital of \$25,000 to mine and deal in coal. The incorporators are F. H. Bruening, F. T. Fitzharris, A. E. Vance, W. McD. Miller and J. S. O'Neil.

**Lexington, Ky.**—The McCormick Lumber Co., with a capital stock of \$75,000, has filed articles of incorporation, under which it is authorized to develop coal, coke and timber lands in Kentucky. The company owns several valuable tracts of coal lands in Powell county, which are traversed by the Louisville & Nashville's L. & E. branch. It proposes to cut the timber on these tracts, and then develop the coal.

# Coal Trade Reviews

## General Review

Trade rounds out the season in better form than anticipated. Colder weather and delays in transportation create some activity. Little preparation being made for a suspension.

With the spring discount on anthracite now only two weeks off the trade is relapsing into the customary lethargy at this period. But as a result of the persistently cold weather over the past few weeks the market is rounding out the winter season in better form than was anticipated, and considerably better than in average years. Stocks in the hands of the dealers are being so rapidly exhausted that many of them are being forced into the market for small tonnages to tide them over. But all such orders are restricted to the lowest possible minimum, and new business is scarce. A gradual slowing down, with individual prices touching the April circular, will probably be the record over the balance of the month. Judging from the business now being negotiated there will be considerable activity at the opening prices, Apr. 1.

The continued low temperatures have had a mildly stimulating effect upon bituminous trade, but the business is still characterized by an almost total lack of interest on the part of buyers. The market has failed utterly to respond to the possibility of a protracted suspension in the mining regions. Concessions are readily obtainable on spot business, although many contracts are being closed at last year's prices. The situation in the Pittsburgh district is decidedly stronger, but not so much as would be expected, as a result of the recent severe weather and the proximity of what may be a protracted suspension. It is generally hoped there will be a suspension of sufficient duration to clean up the surpluses in the market, and inject some snap into the trade.

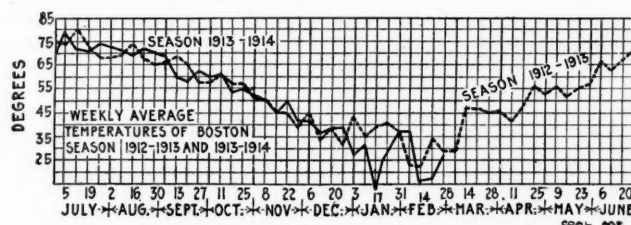
Stocks in Ohio have been well cleaned up by the colder weather, and the trade is much improved under the influence of better orders for both domestic and steam grades. The market is in a waiting attitude, because of the uncertainty in the labor situation, and a turn for the worst in this direction will undoubtedly cause a sharp rush for coal. There is said to be less coal on hand now than at any time during the winter. Spot demand at Hampden Roads has shown some slight improvement, especially as regards inland business, but dumping over the piers continues light; considerable accumulations in the local yards are also reported, but much of this tonnage is being assembled to take care of a number of Government collieries.

The Middle Western trade is showing a stronger inclination to prepare for trouble after Apr. 1. While many of the larger consumers are still skeptical about any serious shortage, because of previous experiences, as a rule they are accumulating extra supplies. As a result of this, and the continued lower temperatures, a great many mines are working up to the full limit of the car supply, and it is clear that the Middle Western trade will round out the season in much better shape than had been anticipated.

tically none of the sizable consumers will show any interest in the market at anything like the \$2.85 basis. The heavy curtailment is still on, but most of the shippers are not slackening up any in their efforts to place current output.

Little interest is apparent in the Pennsylvania coals just now. The threatened suspension in mining is arousing only the mildest kind of attention. Some of the operators have now come out with flat prices and contracts are being closed much along the usual lines, each aiming to hold the tonnage acquired last year. Some light will be thrown on the general status when the Boston Elevated Ry. makes known its decision on its supply for the next season. This is one of the large orders in this territory and the award is usually significant. Practically every coal house of any size has submitted figures and there is much speculation over the result.

It is understood that the Georges Creek factors have closed about their usual tonnage on the basis of \$2.85 f.o.b. Baltimore. For two years at least this grade has shown great steadiness, due both to its popularity among certain trade and to a rather limited output.



**Anthracite**—The recent spring-like weather has caused the retail demand to sag off. Stocks are light, however, in anticipation of lower-priced shipments early in April and there is likely to be some anxiety among retail dealers until they receive their first round of deliveries; many of them have been sailing too close to the wind. The storm early last week in New York and Pennsylvania was practically without result in New England. The prospect is excellent for a heavy demand for April, May and June. The disposition here is to take anthracite in as large a volume as storage will permit.

There has been a rumor about a possible advance of 25c. in the price of stove in the effort to shift some of the demand to other less popular sizes.

Current quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambria Somerset	Georges Creek	Pocahontas New River
Mines*	\$0.95@1.50	\$1.25@1.65	\$1.67@1.77	
Philadelphia*	2.20@2.75	2.50@2.90	2.92@3.02	
New York*	2.50@3.05	2.80@3.20	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.75@2.85
Boston†				3.78@3.83
Providence†				3.73@3.78

\*F.o.b. †On cars.

## NEW YORK

Operations much curtailed by heavy storms of last week. Bituminous trade fails to respond to the strike talk. Loading in the harbor much delayed by frozen coal.

**Bituminous**—A persistent period of moderately low temperatures has served to clean up much of the surplus coal in the local market. Consumption has been increased, and as a result there has been a large hole made in the stocks on hand. On the other hand, the large shipments, delayed by the heavy storm of last week, are now coming in and tending to flood the market.

Transportation conditions are, however, not as free as might be expected. The Pennsylvania R.R. was the first to start coal moving again, and the situation on its lines is now relatively good. On the B. & O., the Reading, and others there is still considerable congestion. Early this week another storm in Pennsylvania again tied up the roads temporarily, distribution on the railroad being reported at only 80%. The general embargo at South Amboy has been removed, but boats are scarce and the loading continues slow, due to the frozen coal.

## EASTERN MARKET

### BOSTON

Practically no change in Pocahontas and New River. Agencies very watchful of one another. Little interest in Pennsylvania grades, contracts being gradually closed along usual lines. Georges Creek shows usual steadiness. Anthracite dull for March loading, but with active business in prospect.

**Bituminous**—The contract situation on Pocahontas and New River mulls along with no pronounced features. The various agencies are watching one another closely and while some low prices are known to have been made they are so well covered up by water freight arrangements that it would be difficult to check them back.

Spot coal is practically unchanged. Concessions continue to be made and contractors are generally dilatory in arranging for March quotas. Stocks are seasonably large and prac-



The local market is failing utterly to respond in any way to the possibility of a suspension in the mining regions. Some contracting is reported at prices said to be on the same basis as last year or better. The spot market is not quotably changed, and we continue it as follows: West Virginia steam, \$2.50@2.60; fair grades Pennsylvania, \$2.60@2.70; good grades of Pennsylvania, \$2.75@2.80; best Miller Pennsylvania, \$3.10@3.15; George's Creek, \$3.15@3.25.

**Anthracite**—With the April discount now only two weeks off, dealers are cutting orders to the lowest possible minimum, in order to carry over as small stocks as possible. The persistent cold weather, however, has stimulated quite a little buying and will serve to wind up the season's business in hard coal in much better form than was anticipated.

Operations in the mining districts have been automatically restricted by the heavy storm, so that last week practically nothing was done until Thursday, while few mines succeeded in getting tuned up to full capacity before Saturday. Full capacity operations was the rule this week.

The demand continues to center around the steam grades. Most of the domestic sizes are still rather heavy. With boats scarce and difficult to load because of the coal being frozen, substantial premiums for loaded cargoes of the steam grades, including pea, were offered early in the week, as much as 30 to 40c. above the circular being readily obtained. Egg is the strongest of the prepared grades, with nut in fair demand, and stove heavy, selling off to the full April circular; April prices will probably prevail on all the prepared grades by Mar. 20, due partially to the fact that the line business is falling off heavily and excess tonnages are being dumped into the tidewater market.

We quote the New York market on the following basis:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken.....	\$5.00		\$5.05	
Egg.....	5.25	\$4.95@5.35	5.30	\$4.90@5.30
Stove.....	5.25	5.15@5.35	5.30	5.10@5.30
Chestnut.....	5.50	5.55	5.55	5.35@5.55
Pea.....	3.50	3.55@3.80	3.50	3.50@3.75
Buckwheat.....	2.75	2.75@2.90	2.70@3.45	2.45@2.90
Rice.....	2.25	2.25@2.40	1.95@2.20	1.95@2.30
Barley.....	1.75	1.75@1.85	1.70	1.60@1.80

#### PHILADELPHIA

**Anthracite trade rather quiet in anticipation of opening prices. Prospects favorable for good spring business. Bituminous in better demand, but prices unchanged.**

**Anthracite**—From now on until the first of April, the anthracite business is not likely to be very heavy. It is true that quite a number of householders, whose bins were depleted by the recent cold weather, have found it necessary to purchase additional supplies, but as a rule, buying at this time means only plying out for the remainder of the season. All the dealers are holding up their orders and conserving what coal they have, until the first of April when the opening prices become effective. It is understood that the new circular prices will be no different from last year, with the exception that the contract sizes will in all cases carry the Pennsylvania State tax.

As indicated by the business that is now being placed for delivery as soon as the opening prices are announced, there is likely to be a shortage in stove coal almost as soon as the market opens for the year's business. As a matter of fact, it is believed that most of the companies have stocks of most every size but stove, which has moved off uniformly throughout the year. There is likely to be little or none of this size carried over, but the dealers claim to be well supplied with egg and chestnut, and it is not a question of waiting until Apr. 1 for additional supplies, as concessions down to the April circular can already be secured from individual operators on these two sizes. Stove coal is likely to be the stumbling block for prompt shipments, and orders for this size are being accepted only on condition that a certain proportion of egg and chestnut accompany them. Broken coal is about the only size that is short in the market at present, and this is only a continuance of a condition that has prevailed throughout the past season. Tidewater business has fallen off entirely. Any orders now being placed as a rule call for sizes that are not likely to be effected by the usual spring discount.

**Bituminous**—There seems to be a slightly better tone to the market on bituminous coal. This is more particularly due to a better demand, rather than to advancing prices. The call seems to be more active, and may be due in part to the heavy weather of the last three weeks, not only retarding production, but interfering with railroad movement. As a matter of fact, operators are assuming a more optimistic attitude, and are looking forward to a better spring and summer business.

#### BALTIMORE

**Shipments interrupted, communication cut off by wire, and other delays due to heavy storms. Upward price tendency was confined to individual cases of necessity. Anthracite men busy.**

Heavy snowfall and blizzard weather conditions of last week generally played havoc with regularity of tonnage movement. For several days the mines were shut off from supplies of empties even after the railroads had reestablished operations and were moving out loaded cars. The roads kept promising as rapid dispatch as possible, but the movement of empties toward mine centers was slow.

The result of interruptions to shipments on contract forced some consumers into the open market who are seldom seen there. For the most part mine connections here were able to supply coal to customers from other sources, but some had to dig outside. There was no excessive charging even on the emergency business, however, as there was plenty of fuel close at hand to meet to all needs. The upward tendency of prices was confined to this emergency call.

There was not quite as much activity to be noted about the piers, as delayed shipments, frozen coals, etc., had an effect. A number of important loadings are scheduled, however, for the rest of the month, and March will show quite healthy figures for both the foreign and coastwise movement. During February a total of 59,756 tons of coal was loaded here for foreign ports, this being a slight decrease from the February figures of 1913.

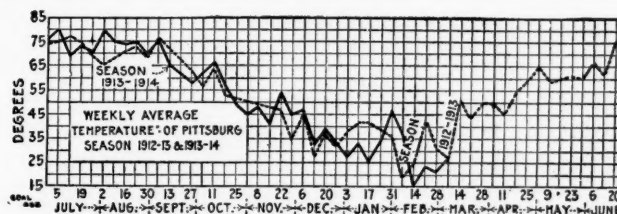
The several snow storms taxed the anthracite dealers here to the full, but the heavy orders on household account were gladly received.

## CENTRAL STATES

#### PITTSBURGH, PENN.

**Prices stiffer, but less improved than would be expected. Every prospect of mining suspension Apr. 1. Some stocking of coal by consumers. No important wage-scale developments. Connellsville coke market slightly easier but not quotably lower.**

**Bituminous**—There has been a slight hardening in coal prices in the past week, so that circular prices are more generally obtained, but there is still some shading. The market is decidedly stronger than it was a fortnight ago, but it is not as much stronger as would be expected on general principles, seeing that the weather has been extremely cold and windy throughout the consuming districts, and it has become practically settled that there will be no wage agreement by Apr. 1. There is considerable stocking of coal, particularly by the railroads, but mine operations have not been increased materially, if at all, and are still not over 50 or 60% of capacity of an average. There have been no important developments in the wage-scale matter since the failure of the subcommittee of the Philadelphia conference to reach an agreement on any of the important points at issue. Circular prices remain: Slack, 90c.; nut and slack, \$1.05; nut, \$1.25; mine-run, \$1.30; ¾-in., \$1.40; 1½-in. steam, \$1.05; 1¼ in. domestic, \$1.55, per ton at mine, Pittsburgh district.



**Connellsville Coke**—The coke market has eased off a trifle in general tone in the past week, though prices are hardly quotable at a lower level. One influence has been the end of the slow movement on railroads, caused by the bad weather, and another has been the failure of the iron and steel industry to show any further improvement. A fortnight ago the railroad movement suddenly slowed down, and while shipments kept up very well the coke was longer in transit, resulting in demand for extra shipments on contract, with a little demand in the prompt market. In the past few days the belated coke has been arriving in heavier tonnages and the tendency now is rather to ask for suspension or curtailment of shipments. As a result the spot market is a trifle easier. The contract market is not particularly affected, since there was hardly any negotiations. Practically all consumers are



covered by contracts to Apr. 1, but a few contracts expire then. There is now, however, little interest in the second-quarter market. The present iron and steel outlook is for stationary blast-furnace operations, hence no increase in consumption. The market remains quotable as follows: Prompt furnace, \$2; contract furnace, \$2@2.10; prompt foundry, \$2.40@2.50; contract foundry, \$2.40@2.60, per ton ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ending Feb. 28 at 313,870 tons, an increase of 10,710 tons, and shipments at 341,784 tons, an increase of 17,614 tons. The shipments reported exceed the reported production by 27,914 tons, and it is stated that the Frick company, the steel-corporation subsidiary, moved 20,000 tons of stock coke in the week.

#### BUFFALO

**Anthracite trade slackening off and not likely to be resumed. Demand for bituminous somewhat better. Winter conditions continue. Coke still dull.**

**Bituminous**—The demand for bituminous is better than it has been lately, though the producer is somewhat handicapped by the special activity of slack, with which certain of the consumers appear to be stocking up against a possible suspension of some length next month. Opinions differ as widely as ever in regard to a suspension. Buffalo jobbers are sending out advices to their customers, but they are careful not to say that one thing or the other is going to happen. The safe thing is to buy a supply when it is to be had.

It is the desire of all operators to allow the mines to remain idle until such a time as the supply is so nearly exhausted there will be some snap to the market. Some members of the trade imagine that the final agreement may include a 30-day suspension, but this hardly seems probable. The difficulty is that the men want to work and there is not a sufficient number of operators who will close down in the face of any sort of demand for coal.

There is a pretty slow movement of cars on account of the snow, which is heavy in most parts of Pennsylvania, but does not interfere with traffic from here Northward or Westward. There has not been much snow in the West this winter. Reports from the stocks on Western lake docks state that the surplus is not nearly so great as it was, but March will have to take more than the average amount to carry it off.

**Coke**—It is probable that the coke trade is a better barometer of the general business of the country than coal and the fact that it does not improve materially is significant. Prices remain quiet on the basis of \$4.50 for best 72-hr. Connellsville foundry. It will not show much strength until iron is moving faster.

**Anthracite**—The demand is falling off fast and will be down to the usual low point of the middle of March when that date arrives. The weather is not cold and besides the orders will soon all be for April delivery. There is little coal here, as the mines have not run strong of late and the snow is heavy. Shipping agents are not making very prompt deliveries on that account. The heavy ice in harbor makes it difficult to move lake craft, though a little coal will be put afloat by one or two shippers. Opening rates will be paid, as the time is so near at hand.

#### TORONTO

**Tendency to stock against a possible suspension and trade better.**

Trade has been good in all lines. The yards are well stocked and deliveries coming forward freely with less difficulty with railroad blockades than was experienced last year. There is some disposition on the part of dealers to give large orders for bituminous so as to provide against a possible shortage as a result of labor troubles in the bituminous fields.

Quotations remain unchanged as follows: Retail, anthracite egg, stove and nut, \$8.25; pea, \$6.75; bituminous steam, \$5.25; screenings, \$4.35; domestic lump, \$6; cannel, \$7.50. Wholesale f.o.b. cars, three-quarter lump, \$3.85; screenings, \$3.

#### TOLEDO

**Continued cold weather has cleaned up stocks. Great scarcity of Pocahontas. Fairly good demand of steam grades in anticipation of a possible shut-down of the mines. Pittsburgh No. 8 strong.**

There is less coal on hand in the Toledo markets than any time heretofore this winter. A continued spell of the real winter weather cleaned the stock of domestics. Being now accustomed to the uncertain weather of this winter dealers do not care to take any gamble with it, especially now that spring is about due.

Pocahontas has been tight, with prices holding firm. The

steam-coal market was slightly stimulated the past days as a result of the agitation over a possible shut-down at the mines. Some of the large factories are, however, still holding off negotiations for storage stocks, but they are watching conditions closely, and if the final meeting of the miners and operators should fail to arrive at an agreement there will likely be a stampede for coal. As it is, the factories seem loath to entirely abandon the hope of buying at the reduced rates after Apr. 1. On the other hand, most of the railroads have already a 35-day supply on hand.

Traffic is not moving as freely at Toledo as might be expected. Most of the dealers find considerable trouble in procuring shipments.

Prices are holding to the following:

	Pocahontas	Hocking	Jack-son	Pomeroy	Massillon	Pittsburgh	Cambridge
Domestic lump..	\$2.25	\$1.25	\$2.50	\$1.75	\$2.50	\$1.40	\$1.40
Egg.....	2.25	1.25	2.50	1.50	2.50	.....	.....
Nut.....	1.75	0.80	2.00	1.75	2.50	1.35	1.20
¾ lump.....	.....	0.90	.....	.....	.....	1.20	1.20
Mine-run.....	1.40	1.15	.....	.....	.....	1.10	.....
Slack.....	.....	0.70	.....	.....	.....	.....	.....

#### COLUMBUS

**Movement improved, but demand is still far from absorbing the possible output. Car shortage hampered operations some. Price list well maintained and there is an increase in stocking-up orders.**

The trade continues to improve under the influence of better orders for both domestic and steam grades. The price list is being upheld in every respect and there are few cases of cutting to force trade. The market is in a waiting attitude due to uncertainties in the future. The mine-run law together with the rather unseasonable weather has set aside all former precedents.

The steam business is fairly strong in every particular. Some of the larger steam users are stocking up, although that movement is not as large as might be expected under the circumstances. The fact remains that most of the steam consumers permitted their regular shipments to come forward during the winter, when their consumption was not large and consequently a considerable stock was accumulated; they can also secure West Virginia coal in sufficient quantities to keep them going. Railroads are said to have stocked up for about 60 days.

In the domestic trade demand is fair from dealers, but they are only buying in small orders, as their efforts are directed toward cleaning up, rather than collecting stocks. There is a fairly good demand for anthracite, Pocahontas and the rescreened varieties from West Virginia.

Because of the lack of equipment and the severe snow storm, railroads have been having difficulties in moving coal. Empties have been slow in being returned and many of the mines with orders, had to curtail production. As a result the Hocking Valley only produced about 50% normal and eastern Ohio the same. In the Pomeroy Bend district the output is estimated at 70 to 80%.

Quotations in the Ohio fields are as follows:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Domestic lump.....	\$1.50 @ 1.40	.....	\$1.50 @ 1.45	\$1.50 @ 1.40
¾ inch.....	1.35 @ 1.30	\$1.20 @ 1.15	1.35 @ 1.30	1.35 @ 1.30
Nut.....	1.25 @ 1.20	.....	1.30 @ 1.25	1.25 @ 1.20
Mine-run.....	1.15 @ 1.10	1.10 @ 1.05	1.15 @ 1.10	1.15 @ 1.10
Nut, pea and slack..	0.85 @ 0.80	.....	0.90 @ 0.85	0.80 @ 0.75
Coarse slack.....	0.75 @ 0.70	1.00 @ 0.95	0.80 @ 0.75	0.70 @ 0.65

#### CLEVELAND

**Moderately cold weather and a fair demand is keeping the market firm at low prices. The lake freight market has been complicated by an attempt to break the current rate for transporting coal. Chartering at 1913 rates continues.**

Although operators have been expecting a flood of orders in advance of Apr. 1, the sales have been only moderate. A large number of companies have stocked, but it was done when the market was more abundantly supplied than at present. There is a tendency toward higher prices on some of the large sizes, but nothing of a substantial nature has developed.

Cars are not as plentiful as they were. The Wheeling & Lake Erie notified some of its shippers to load the cars as fully as possible and on other roads the supply is just about equal to production. The poorer equipment has been loaded with railroad coal and is standing on side tracks along the lines. This storing by the railroads is the only reason, so far as shippers are able to learn, for a shortage of cars.

The Pittsburgh Coal Co. last week canvassed the vessel offices for boats to carry coal to Duluth-Superior and to Port Arthur during 1914 at 25c. The rate to Lake Superior for the last few years has been 30c. and several million tons have

been placed at this rate, vessel managers having refused to consider the lower price. Simultaneously with the effort of the Pittsburgh Coal Co. to break the rate, announcement was made that 1,000,000 tons had been placed with vessel owners for Superior delivery at 30c. One hundred thousand tons of soft coal also were placed for Fort William-Port Arthur delivery this season at 30c. It is now doubtful if a lesser rate will be possible.

Spot sales are a little lower than sales for shipment and away from Cleveland sales are being made on shipment prices. The spot market is as follows:

	No. 8	Middle District	Pocahontas
Lump, 14 in.....	\$2.05@2.15	\$2.15@2.25	\$3.60
Lump, 1 in.....	2.00@2.10	2.00@2.05	
Egg.....			3.60
Mine-run.....	1.95	1.85@1.90	2.75
Nut.....	2.00@2.10	2.00@2.10	
Slack.....	1.95@2.00	1.85@1.90	2.60

#### DETROIT

**Lower temperatures and uncertainties in the labor situation have stiffened up the market. Demurrage coal mostly cleaned up.**

**Bituminous**—The local market is a weather proposition, although interruptions to transportation and possible labor troubles are also determining factors. The lower temperatures have helped the market materially, particularly as regards demurrage coal, but the possibility of the strike does not seem to create any important movement. The inclement weather interfered with operations at the mines and the movement on the roads. While a slight stiffening in the market is noted, this is more or less of an artificial nature due to the possibility of labor trouble.

**Anthracite**—Hard coal is in good demand with some grades commanding substantial premium, due to the difficulty in obtaining prompt shipments as a result of the inclement weather.

**Coke**—Connellsville 72-hr. foundry coke is quoted at \$2.55, with Semet Solvay at \$3, and gashouse at \$2.65. Local ovens are reported as working full capacity.

#### HAMPTON ROADS

**Shipments from Hampton Roads still slightly below normal. Demand light, although showing some little improvement.**

The dumpings over the Hampton Roads piers for the week have been somewhat light, although there have been a number of large shipments both foreign and coastwise. While there is little demand for spot coal there has been a slight improvement and indications are that, unless the weather should turn considerably warmer, the demand will continue to improve. This is especially true on the inland trade.

Prices on all grades at tidewater and inland are the same as they have been for some weeks. The accumulation of coal at all piers is still somewhat above normal but not excessively so. Some of the accumulated coal is being assembled to take care of government colliers about due.

Export shipments for the week have moved to Canal Zone, Montevideo, Trieste, Port of Spain, Cienfuegos, Santiago, Havana and Dakar.

The total dumpings over the Hampton Roads piers for the month of February amounted to 875,783 tons; of this quantity the Norfolk & Western Ry. dumped over the Lamberts Point piers 440,236 tons, the Chesapeake & Ohio Ry. at Newport News 234,685 tons and the Virginian Ry., from Sewalls Point 200,862 tons.

#### LOUISVILLE

**Consumption holding up well, in spite of moderating weather. Prices remain low, due to the lateness of the season and fear of discouraging buying. Car situation good.**

The trade has been favored with a continuance of fairly severe weather, causing a continued demand for domestic grades, and buying on the part of the retailers has become quite general. Stocks seem to have been exhausted with remarkable rapidity, indicating that few consumers had any coal on hand.

The steam market is fair. The demand is all that could be expected, but the supply is now ample, due to the increased activity at the mines. Those concerns which made price concessions are finding it difficult to get back to a proper level in this department. Talk of possible labor trouble in various fields is becoming general, but seems as yet to have had no effect on the market.

The fact that some mixed coal is being furnished to railroads by eastern Kentucky mines is responsible for the appearance of pea and slack from that section, as there is always plenty of this grade from western Kentucky; the price is low, running around 15c. For nut and slack the price ranges from 55@60c. for low grades to as high as 85c. for the better grades.

## SOUTHERN AND MIDDLE-WESTERN

#### INDIANAPOLIS

**Heavy orders for screenings and steam grades. Mines would run full schedule, if sufficient cars were available. Premium prices offered. Domestic market a weather proposition.**

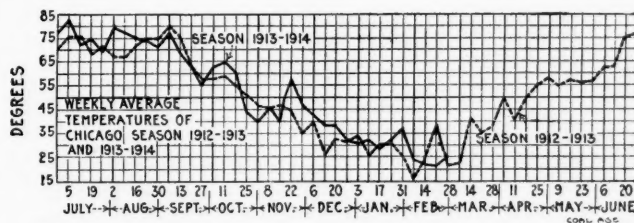
While the car service is reported improved, mines are not able to run at more than 80% capacity, and operators seem to have enough to put their mines on full schedule. One of the largest companies of the state says it will not now be able to catch up with orders by Apr. 1, when the wage contract ends, and this applies also to most other companies.

The rush of orders is due almost altogether to the fear of a suspension of work in April. Premiums are offered on all grades, with the exception of domestic lump, the demand for which is a weather proposition. Screenings can be sold for 90c., which is much better than the price prevailing up to the early part of February. There is a premium of about 10c. a ton over previous prices for steam grades. The mine price for domestic lump is around \$1.75, with buyers showing anxiety as this coal is not put in stock. February weather made it necessary to consume more domestic coal than in January and December combined, much to the profit of the dealers. The early March weather has been a continuation of the February kind, and business holds good with the retailers. They have made no change in prices, and it is questionable if they will do so, even with a suspension of mining in April.

#### CHICAGO

**Little change in the local market. Buying still comparatively heavy as a result of the continued cold weather. Retailers' storage piles being reduced considerably and they are forced to buy.**

Despite the fact that the joint conference has been adjourned with no future date set coal buyers are not showing any trace of anxiety. With only a limited demand for domestic coal, mines are on a short production and as a result there is a reduction in the supply of screenings and the price is advancing.



Dealers are buying more anthracite, but not enough to seriously change the situation. There is a tendency to fill their needs up to Apr. 1 with odd cars or demurrage coal, which they can obtain at a low price. Steady conditions prevail in the smokeless market, but the coal is not unusually active. The Springfield market has experienced an improved demand for steam coal; the evident shortage in the screenings supply has resulted in an increase of 5 to 10c. a ton for this coal. This higher figure has brought out a bigger demand for mine-run, egg and steam lump. There is nothing of import in the coke market, the demand being quiet.

Prevailing prices in Chicago are:

	Springfield	Franklin Co.	Clinton	W.Va.
Domestic lump.....	\$2.07@2.17	\$2.55@2.65	\$2.12@2.27	
Steam lump.....	1.97		1.97	
Egg.....		2.55@2.65		\$3.70
Mine-run.....	1.87	2.20@2.25	1.87	3.30
Screenings.....	1.67@1.77	1.90@2.05	1.67@1.77	

**Coke**—Connellsville, \$5.25; Wise County, \$5@5.25; byproduct egg and stove, \$4.90; byproduct nut, \$4.75; gashouse, \$4.50.

#### MILWAUKEE

**Large stocks on hand and little apprehension over the possible labor difficulties.**

If all upper lake ports are as well supplied with coal as Milwaukee is, a month or two of idleness at the mines this spring will not cause any great disturbance. It is estimated that there is fully 20% more coal on the docks here than at this time last year. This is true of all grades of domestic and commercial coal.

This condition is not altogether the result of a mild winter, as there has been a fair movement of steam coal right along. It is due in a large measure to the foresight of dealers,



who docked much larger stocks last year than has been their custom, in anticipation of labor complications at a time when supplies are usually at a low ebb.

February was a real winter month from the standpoint of temperature, and the draught upon stocks during that period was the heaviest of the season. From now on the movement is expected to be normal. Prices have been fairly well maintained throughout the season. Shippers and vessel men do not expect the upward movement of coal to begin until early in May.

#### ST. LOUIS

**Coal markets generally stronger all along the line, but with prices still relatively low. Railroads and large consumers gradually accumulating surpluses. Car shortage.**

Continued winter weather, cold and threatened snow, has kept the domestic market in fairly good condition, and a good volume of coal is moving. Standard coal, 2-in. lump, has touched 85c. in some instances, with an average of 90c. Cartersville 6-in. lump sold around \$1.15 and \$1.25, while screenings from both have a tendency to increase in price.

As has been intimated before, several railroads and large consumers are buying in five- and ten-car lots and scattering their purchases over a wide territory so as not to cause any undue excitement, and an advance in prices. It is estimated that something like one thousand cars of mine-run coal from the Cartersville and other fields were purchased during the past week, for shipment throughout the balance of the month. The screenings market is high enough at this time to warrant bringing in West Kentucky coal, and a local company with mines there has sold two lots of screenings.

In the past the steam plants have been loaded full with high-priced coal, and this year they are skeptical about buying. This will have the result of making some fancy prices in April to those who are not stocked.

There is practically no anthracite or smokeless moving, and the same applies to coke. On Illinois coals it is likely there will be a general advance on all sizes the coming week. There is a serious car shortage on the C. & E. I. and cars are not any too plentiful on the other lines.

The prevailing prices are:

	Cartersville and Franklin Co.	Big Muddy	Mt. Olive	Standard	Sparta
2-in. lump.....				\$1.05 @ 1.10	\$1.15
3-in. lump.....					
6-in. lump.....	\$1.25 @ 1.50		\$1.40	1.25 @ 1.35	1.25
Lump and egg.....	1.85 @ 2.15	2.15			1.15
No. 1 nut.....	1.20 @ 1.40				
Screenings.....	0.75 @ 0.85			0.55 @ 0.60	0.60 @ 0.65
Mine-run.....	1.10 @ 1.20				
No. 1 washed nut...	1.50 @ 1.60	2.25	1.50		
No. 2 washed nut...	1.25 @ 1.35		1.25		
No. 3 washed nut...	1.25 @ 1.30				
No. 4 washed nut...	1.25 @ 1.30				
No. 5 washed nut...	0.75 @ 0.80				

#### KANSAS CITY

**Dealers refusing to buy ahead and situation unsatisfactory. Mines working moderately steady and prices fairly well maintained.**

The situation in Kansas City and the Southwest is far from satisfactory. Dealers are buying with caution, ordering only for eleventh-hour demand, refusing to anticipate their wants far enough ahead to allow for transportation from the mines. This means that operators must maintain stocks at their sales offices in Kansas City and elsewhere, and the coal is left on track, causing demurrage charges to be added to the cost of marketing.

About five days a week seems to be the average at the mines. The market has been steady at the quotations which have prevailed since the first of the year. Cherokee and Mexican lump is quoted at \$2, f.o.b. mines; nut, \$1.85; semi-anthracite, \$2.50, and Lexington lump, \$2.

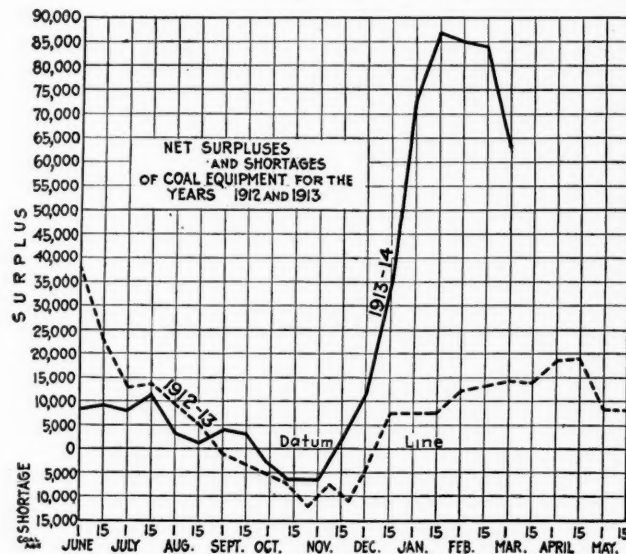
## PRODUCTION AND TRANSPORTATION STATISTICS

#### ANTHRACITE SHIPMENTS

The hard-coal shipments for February touched the lowest for any normal month since August, 1909. Gross February shipments were 4,121,451 tons as compared with 5,175,732 tons in January, and 5,662,618 tons in December. The total shipments for the two months of the year are only 9,297,183 tons as compared with 12,010,588 tons last year.

Details of the anthracite shipments for February and the two months of this year and last year were as follows:

	February		2 Months	
	1914	1913	1914	1913
Phila. & Reading.....	746,793	1,165,449	1,761,319	2,422,581
Lehigh Valley.....	681,844	1,062,129	1,492,432	2,237,280
Cent. R.R. N.J.....	563,650	761,070	1,268,141	1,574,437
Del. Lack. & West.....	573,553	763,571	1,192,491	1,685,670
Del. & Hudson.....	442,378	567,371	1,029,271	1,220,548
Pennsylvania.....	426,100	491,062	962,218	1,067,614
Erie.....	533,307	655,919	1,239,610	1,373,154
Ont. & Western.....	153,826	207,598	351,101	429,304
Total.....	4,121,451	5,674,169	9,297,183	12,010,588



#### VIRGINIAN RAILWAY

The total shipments of coal over this road for January, 1914, were 407,109 tons, as compared with 453,886 tons for the same month last year.

## COAL FREIGHT DECISIONS

**I. C. C. No. 4806—Youngstown Sheet & Tube Co. vs. Pittsburgh & Lake Erie R.R. Co.**

Rate of 70c. per net ton for the transportation of bituminous coal in carloads from the Pittsburgh, Penn., coal district to the Youngstown or Valleys district of eastern Ohio and western Pennsylvania, not found unreasonable or unjustly discriminatory. Complaint dismissed.

## COAL SECURITIES

William J. Hoey reports the market on various coal securities for the week ending Mar. 7, as follows:

Stock	Bid	Asked	Stock	Bid	Asked
American Coal.....	80	95	Jef. & Cle'd. C. & I. Pfd...	75	85
American Coal Products...	83	84	Kentucky Block Cannel...	40	60
Amer. Coal Prod. Pfd.....	104	106	Lehigh Valley Coal Sales...	185	195
Big Muddy Coal & Iron...	75	100	Leh. & Wilkes-Bar. C. Co...	300	350
Burns Bros.....	50	53	Mahoning Coal R. R.....	700	750
Burns Bros. Pfd.....	94	99	Mahoning Investment.....	73	78
By-Products Coke.....	112	116	Maryland Coal of Md.....	3	6
Central Coal & Coke.....	80	86	Maryland Coal of W. Va...	7	9
Central Coal & Coke Pfd...	78	86	Maryland Coal of W. Va.		
Chicago Lumber & Coal...	50	56	(5% Bonds).....	54	62
Chicago Wil. & Ver. Coal...	25	32	Midland Coal.....	80	90
Colo. Fuel & Iron Pfd.....	140	160	N. Y. S. & W. C. Pfd.....	15	30
Cumberland Corporation...	10	14	Pocahontas Con. Collieries...	92	101
Cumberland Corp. Pfd.....	40	43	Pocahontas Con. Coll. Pfd...	98	105
Del. Lack. & West. Coal...	260	270	Texas & Pacific Coal.....	97	101
Elkhorn Fuel.....	4	10	United Coal of Pittsburgh...	3	9
Elkhorn Fuel Pfd.....	55	70	Victoria Coal & Coke Pfd...	40	80
Hocking Valley Products...	1	4			

Bonds	Bid	Asked	Bonds	Bid	Asked
By-Prod. Coke, 6's, 1930...	100	102	New Mex. Ry. & C'l 5's 1951	96	99
Carnegie Coal, 5's, 1917...	98	101	New Riv. (Coal) 1st, 5's, 1934	75	83
Consol. Coal, Conv., 6's, 1923	100	102	Pleas. Val. C., 1st, 5's, 1928...	88	92
Consol. Coal, Ref. 5's, 1950...	88 1/2	91	Pocah. Collieries, 5's, 1937...	94	98
Cumberland Corp., 6's, 1915...	97	99	Pocah. Con. Coll., 5's, 1957...	85	87
Erie-Pa. C. Col. Trust, 4's, 1951...	90	91 1/2	Solvay Collieries, 5 1/2's, 1931...	96	99
Fairmont Coal, 5's, 1931...	93	96	Sunday Creek Coal, 5's, 1944...	58	64
Lack. Coal & Lum., 6's, 1961...	57	59	Vic. Am. F. 1st, & Ref. S. F.		
Monongia Riv. C., 5's, 1945...	92	95	6's, 1940.....	90	100
N.Mex. Ry. & Coal, 5's, 1947	96	99	Vic. Fuel 1st S. F., 5's, 1953...	75	90
			Webster C. & C. 1st, 5's, 1942	79	84